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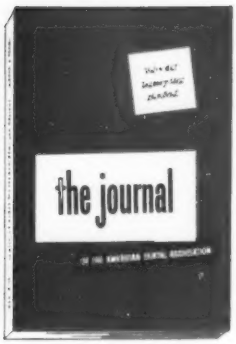

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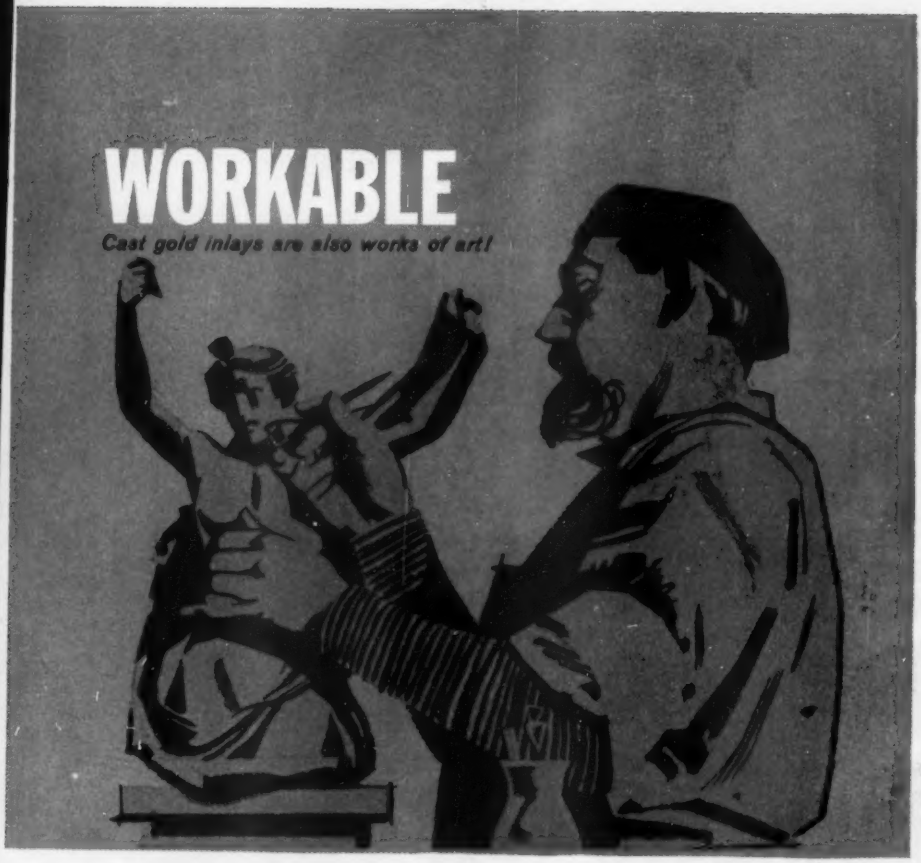

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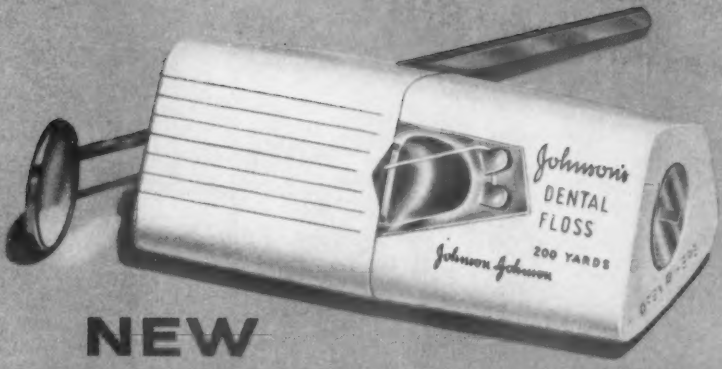

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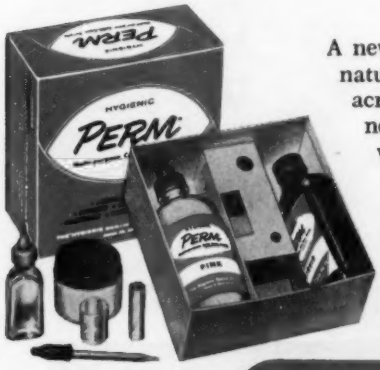

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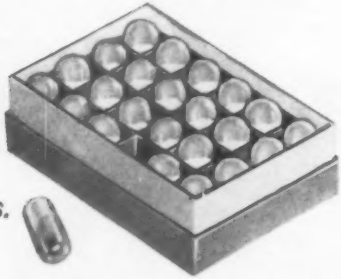

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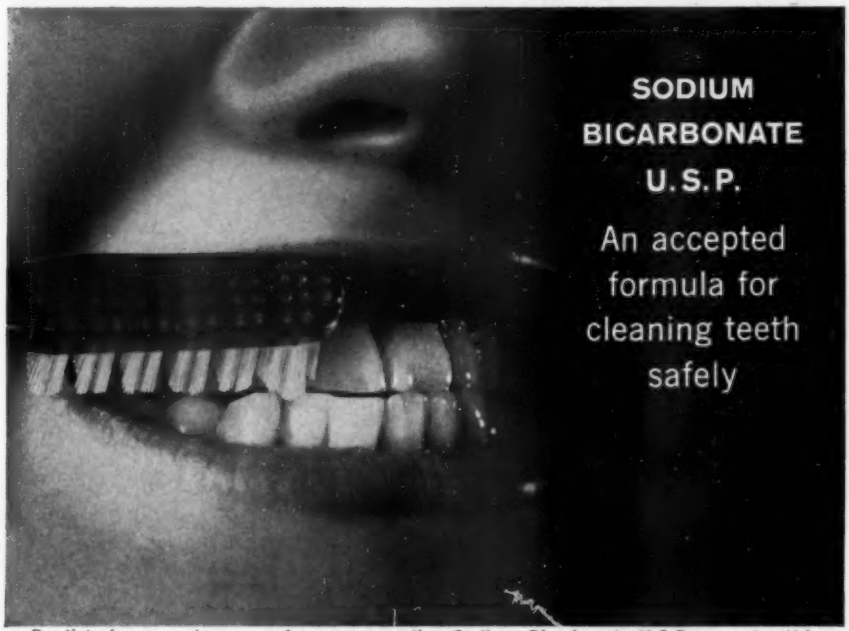

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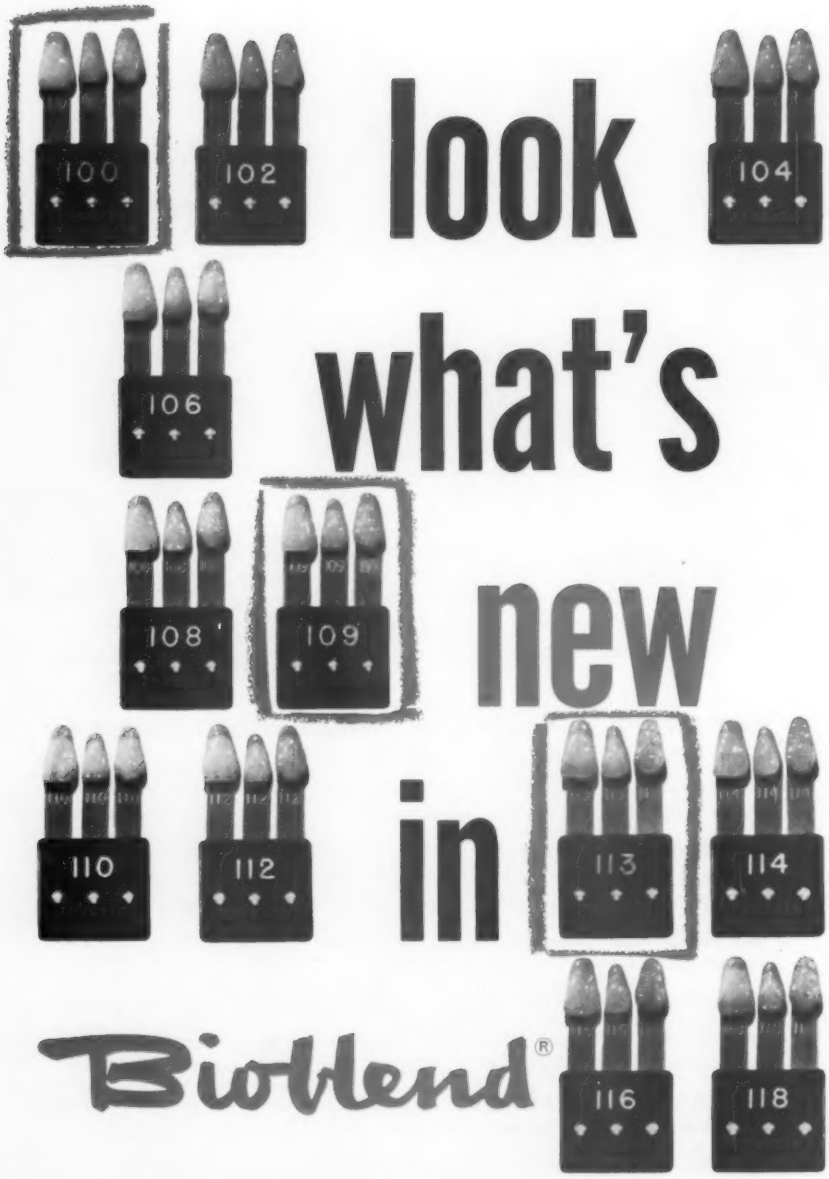

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Stress breaking for partial dentures

Jack L. Kabcenell, D.D.S., Rye, N. Y.

Many and varied stresses are imparted to the hard and soft tissues which bear a distal extension partial denture. The dentist must incorporate into the design of such a denture those factors which best help the tissue of the patient to remain in a healthy state. Some type of stress-breaking action must be incorporated into a Class II partial denture, particularly when the patient has weakened abutment teeth. The ideal stress-breaker does not exist. The dentist must evaluate the three main types of stress-breakers and select that type which provides the patient with maximum masticatory function and comfort and minimum damage to the supporting structures.

A fixed prosthesis is the treatment of choice for the replacement of missing dental units. Such a prosthesis often is not possible, however. One of the chief contraindications to use of a fixed prosthesis is the absence of posterior abutments and the absence of more posterior units than could successfully be replaced by a cantilever fixed bridge. Such cases comprise the Class I and II (Kennedy) classification, and the treatment plan calls for the distal extension partial denture.[1]

Any denture represents the imposition of an inanimate object onto a most animated region where it will be subject to countless multidirectional forces. It is not possible to analyze accurately all the mechanobiologic forces that will act on the denture and, therefore, the dentist cannot, with any great exactitude, eliminate or ameliorate all the harmful components of these forces. He can, however, be wary of the most serious offenders and attempt to design the denture so as to avoid as many of the malevolent consequences of these forces as possible.

The distal extension partial denture involves considerations of support that are different from those of the complete denture or the tooth-borne partial denture. The distal extension partial denture is both tooth-borne and tissue-borne at

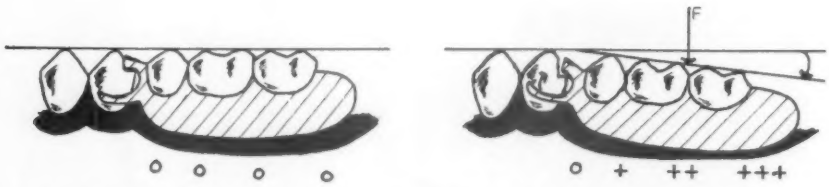


Fig. 1 • Left: Rigid distal extension partial denture, with distal rest and mesial clasping, at rest. Right: Under occlusal force (F), saddle tilts with fulcrum at distal end of rest seat, resulting in overcompression of mucosa at distal end of saddle and occlusodistal movement of clasp

the same time, and teeth and mucous membrane are not even remotely equivalent in their supportive abilities. Mucous membrane possesses resilience that enables it to yield to pressure and return to original form after the pressure is removed. This resilience is a product of the elasticity, vascularity and thickness of the soft tissue. The healthy tooth also exhibits resilience because of its attachment into the alveolus by means of a periodontal membrane. However, the degree of resilience in the tooth is only one-fourth to one-twentieth as great as that of the mucous membrane covering the alveolar ridge.[2] It has been estimated that, in order to give equivalent resistance to occlusal loading as that provided by healthy teeth, the size of soft tissue support would have to be 18 times the area of the mucosa covering each extraction socket.[3] Such an amount of soft tissue support does not, of course, exist in the human jaw. The teeth and mucosa not only vary greatly in resistance ability and in resiliency, but also are governed by different pain thresholds.[4-7]

It, therefore, becomes apparent that in a rigid tooth-and-tissue-borne prosthesis the teeth must provide far more support than the soft tissue, for the soft tissue will move away under an occlusal load a greater amount than can the teeth. This heavy loading of the abutment teeth may be perfectly acceptable when the abutment teeth are outstandingly healthy, but if the abutment teeth have lost some of their alveolar support, as is most often the circumstance by the time a patient has lost all or many of his posterior teeth, such a prosthesis may condemn the abutment teeth.[8-12]

The most essential objective must be to retain in health the oral structures that remain, and the secondary objective is the restoration of missing structures. With this in mind it behooves the dentist to evaluate the support available for the partial denture in relation to the stresses this denture will transmit to the supporting structures. The ability of the abutment teeth to resist occlusal loading without damage is directly proportional to the amount and quality of their investing tissues, the crown-root ratio, the number, size and shape of the roots and the degree of fixation of the abutments to other teeth.[13-14]

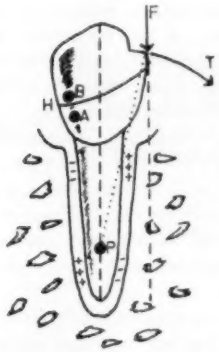
STRESSES ON RIGID PARTIAL DENTURE

An examination will be made of the stresses resulting from occlusal forces on the most common type of distal extension partial denture. This is classically the rigid lower partial denture with an occlusal rest on the distal aspect of the single abutments and clasps terminating in the mesiobuccal and mesiolingual undercuts on the abutments (Fig. 1, left). At this time the discussion will be limited to the vertical occlusal forces and not the lateral ones. When masticatory force is imposed on the teeth of this prosthesis, the saddle is depressed into the

mucous membrane to a degree consistent with the magnitude of the force, the point of force application, and the thickness and nature of the mucous membrane overlying the alveolus. The point of force application becomes a factor of total force absorbed by the mucosa in that the closer this point is to the occlusal rest, the greater is the proportion of the force taken by the abutments. Since this energy can neither be created nor destroyed, if more of a given amount is absorbed by the abutments, less remains for the mucosa.

When occlusal loading occurs on this prosthesis, the saddle moves tissueward to a greater extent than can the occlusal rest (Fig. 1, right), since the mucosa supporting the saddle will depress to a greater degree than will the tooth supporting the occlusal rest. As a result of this, an arc of motion manifests itself in which the distal edge of the rest seat becomes the fulcrum point and the radius of the arc is the distance from this fulcrum point to the most distal contact of saddle and mucosa. This arc determines that the saddle cannot be depressed into the mucosa uniformly, as might occur with a purely vertical saddle displacement, but that the distal part of the saddle will move into the tissue more than will the mesial part of the saddle. The uneven displacement causes increased distal ridge resorption, with a concomitant greater inequality of displacement and even greater resorption. This is something of an oversimplification because in bilateral distal extension dentures the occlusal rest on the balancing side also acts as a fulcrum, resulting in increased pressure, not only at the distal end of the saddle but also on the buccal slope of the alveolar ridge on the working side.

The abutment tooth suffers from this arrangement of forces in three ways (Fig. 2): First, since the fulcrum point is at the most distal edge of the rest seat, the occlusal force acts vertically on the tooth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sult in osteoclastic bone changes distal to the neck of the abutment teeth and mesial to the root in the region of the apical third. The ultimate result is hypermobility of abutment teeth.

Naturally, since an undue amount of pressure is delivered to the saddle at its distal termination, excessive ridge resorption occurs here. Such ridge resorption allows for an even greater tipping of the partial denture, and the vicious cycle continues.

If the distal extension partial denture is not to be just another steppingstone along the road to a complete denture, it is imperative to decrease, distribute or redirect the forces that lead to destructive activity in the supporting tissues. Features of stress alleviation must be incorporated into the design of the prosthesis in accordance with the individual needs. The need for stress alleviation for preservation of abutment teeth is inversely proportional to the amount of investing structures, the quality of these structures, the number of abutment teeth, and the size and number of abutment roots, and is directly proportional to the length of the abutment crowns, the length of the saddle, the displaceability of the mucosa under function and the inclination of the alveolar ridge.[15,16]

STRESS REDUCTION

The effect of vertical loading on the prosthesis can be reduced in three ways:[17-21]

1. Reduction of the load itself.
2. Increased load distribution on each type of supporting tissue.
3. Equalization of the load between tooth and mucosa in accordance with the needs and resistive abilities of each.

The reduction of the occlusal force as applied to the prosthesis will be considered first. Pressure is inversely related to the size of the bearing surfaces, so the pressures can be distributed within the appliance by altering the size of the occlusal surfaces of the teeth. By reducing the size of the teeth increasingly in a distal direction, often even to the point of using cuspids for second molars, the pressure is reduced at the distal end of the saddle where it would normally be most traumatic. The operator also can eliminate the most distal tooth and thus eliminate the most distal point of force application. If, in addition to this, the cutting surfaces of the teeth are made more efficient, the total force necessary for adequate mastication may be reduced.

The second consideration is that of increasing the distribution of the load on each type of tissue. Since pressure is inversely proportional to the size of the pressure-bearing area, increasing the areas will result in decreased pressure on each unit area. Decreasing the pressure on the supporting mucosa is accomplished by making the denture base cover as large an area as possible. The pressure can be decreased on any abutment tooth by increasing the number of abutments. This can be accomplished by the use of multiple rests or by the splinting of other teeth to the abutment tooth.

The third, and most complex, method of decreasing destructive vertical load is by varying the load between teeth and alveolus. This method involves three procedures. They are:

1. More anterior positioning of occlusal rest.
2. Physiologic basing.
3. Altering the nature of the connection between clasp and saddle.

A more anterior placement of the occlusal rest can do several beneficial things for the partial denture (Fig. 3, left). Increasing distance between the distal end of the denture and the occlusal rest decreases the angle of incline occurring when the denture tilts under masticatory loading. As a result, the pressure on the ridge is more nearly equalized and is less concentrated at the distal denture termination. Also, as the rest moves ante-

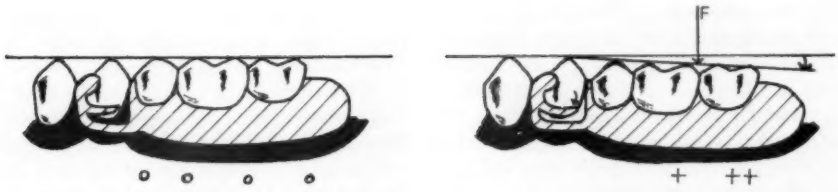

Fig. 3 • Left: Rigid partial denture, with mesial rest and distal clasping, at rest. Right: Under occlusal force (F), saddle tips some, resulting in moderate overcompression at distal end of saddle and gingivomesial movement of clasp

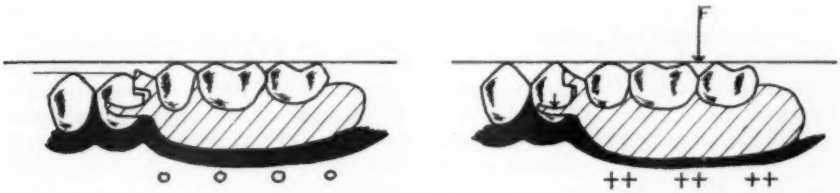

Fig. 4 • Left: Rigid mucocompression partial denture, at rest. Right: Under occlusal force (F), saddle moves vertically, resulting in even compression of saddle mucosa and vertical gingival movement of clasp

riorly, the proportion of the load supported by the alveolus increases. Placement of the rest on the mesial aspect of an abutment tooth will tend to rotate the tooth anteriorly, and this rotation is considerably better resisted by anterior components than would be the distal rotation. This design also better resists bodily distal movement of the denture. In dentures with a mesial rest and distobuccal and distolingual clasp fingers, when compression of the mucosa and distogingival rotation of the denture occurs, the clasps will move out of contact and toward the gingiva into areas of lesser contour without any rotatory pressures on the abutments (Fig. 3, right).[22]

PHYSIOLOGIC BASING

Physiologic basing, or mucocompression, is a technic in which the final model for the partial denture reflects the soft tissue under pressure. This can be accomplished by a combination impression using a pressure technic for the soft tissue and a nonpressure technic for the abutments or by using a pressure impression technic while the metal framework is in position. As a result, the tooth-borne segments of the prosthesis attain seating contact with the abutment teeth only when vertical force is applied to the denture teeth (Fig. 4). At rest, the resilience of the tissues underlying the saddle moves the denture occlusalward and the rests move out of contact with the rest seats. This can be true, naturally, only if the clasps are sufficiently flexible to permit the denture to rise.[23]

Advocates of this method believe that the initial pressures of mastication are absorbed by the mucosa underlying the saddle and then the remaining pressures are distributed between the mucosa and the abutment teeth. It has further been indicated that only a small load is necessary to displace the mucosa almost as much as a maximal one, resulting in the occlusal rest coming into contact with the rest seat very early in the masticatory stroke. After this early seating of the

rest, the pressures are distributed to both soft tissue and tooth structure just as in a rigid partial denture. This same technic can be utilized even better with precision attachment retainers wherein, at rest, the gingival floor of the male attachment is 0.5 to 1.0 mm. above the gingival stop of the female attachment.[24-26]

Mucocompression has the following advantages:

1. Pressures on abutment teeth are reduced.
2. Compression and release of saddle against soft tissue in beginning movement is bodily vertical and is stimulating to the tissue.
3. The clasp contact must, of necessity, be very light, which reduces torque on abutments.
4. Such dentures are relatively simple to design, easy to construct and are sturdy.

Its disadvantages are as follows:

1. It is very difficult to execute multiple clasping.
2. An increased amount of force must be absorbed by the ridge. If the ridge cannot absorb this force, considerable ridge resorption will occur.
3. Horizontal reciprocity of clasp arms is virtually impossible to attain in a denture that moves in function.
4. Stabilization is lacking in a movable denture.
5. The space, at rest, between the occlusal rest and the rest seat is a distinctive food trap, as are the spaces under the clasp arms.
6. The denture feels somewhat awkward to the wearer because the teeth are in hyperocclusion and because it moves so much in function.
7. Efficient indirect retention cannot be attained.

STRESS BREAKING

The third manner of varying the load between the teeth and the alveolus is by altering the nature of the connection between tooth-borne unit and the tissue-borne unit. The tooth-borne unit, or direct retainer, is that part of the framework that attaches directly to the abutment and whatever framework is rigidly joined to it. The tissue-borne unit is the saddle and anything rigidly attached to it. This method encompasses all the varying technics of stress breaking. A stress-breaker, by definition, is a device that relieves the abutment teeth of all or part of the occlusal forces. The main objective is not so much stress breaking, as stress equalization, so that the stress on the abutments and on the tissues underlying the saddle will be equal to their individual resistive abilities.

Stress-breakers are of three main categories:

1. Those having a certain freedom of movement in the direct retainer.
2. Those with a movable joint between the saddle and the retainer.
3. Those having a flexible connection between the direct retainer and the saddle.

The ultimate in rigid fixation of the direct retainer to the abutments is the intracoronal attachment, precision or semiprecision. However, clasp partial direct retainers can be fixed quite rigidly to the abutments, particularly if the greatest clasp bulk is occlusal to the height of contour.[27-30]

Stress breaking, by allowing freedom of movement in the direct retainer, represents a system whereby most of the occlusal forces are transmitted to the alveolar ridge. In such instances the clasping is very weak and flexible and the occlusal rest is often absent. A partial denture with no rests, full saddles and combination clasps containing wrought wire for the resilient arms might be typical of such a prosthesis. Such an appliance is useful only when the abutment teeth can tolerate no extra force, and in such instances the choice of these teeth as abutments might be questioned seriously.[31-35]

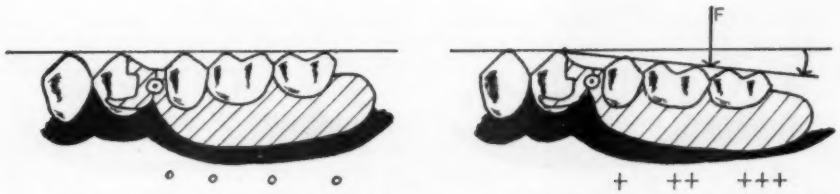

Fig. 5 • Left: Hinge stress-breaker partial denture, at rest. Right: Under occlusal force (F), saddle tips with fulcrum at hinge, resulting in overcompression of mucosa at distal end of saddle but no clasp movement

A denture so designed has the advantage that little or no extra strain is placed on the abutment teeth. Its disadvantages are the negative of all of the advantages by clasps and rests:

1. Lack of direct retention.
2. Lack of lateral force transmission.
3. Lack of established vertical placement of denture.
4. Bearing of full force of mastication by alveolar ridge.
5. Absence of proprioceptive response by abutments to mediate pressure on denture.

The second group of stress breakers are those with movable joints between the saddle and the retainer. There are countless designs within this group, but they are all essentially variations of the hinge, pivot or vertical slider.[36-38] The hinge and pivot types have a joint attached to the fixed retainer, usually at the distal aspect of the last abutment (Fig. 5, left). The fixed retainer remains fixed in position during function, while by virtue of the joint the saddle moves with freedom usually vertically and to a more limited degree laterally. Under vertical loading on the denture teeth, a pivoting occurs at the joint and a greater proportion of stress is delivered to the alveolar ridge than to the abutment. Because of the arc of motion, the distal end of the saddle moves into the mucosa while the mesial end moves little, if at all (Fig. 5, right). This is similar to the saddle movement of the rigid partial denture but without as much torque on the abutment teeth because the clasps do not move and because the fulcrum point is usually closer to the gingiva than an occlusal rest would be. This uneven pivoting movement is minimized by placing the joint as far gingivally as mechanics will permit. Any such rotating joint should have stops that limit the gingivalward pivoting and prohibit occlusalward pivoting.

It must further be remembered that although the torque on the abutment is reduced, it is not eliminated because the abutment supports the fixed retainer, the fixed retainer supports the joint, and the joint supports the mesial end of the saddle. Therefore, some of the pressure delivered to the saddle teeth is transmitted through the joint and the retainer to the abutment tooth. Placing the joint as far anteriorly as possible decreases the torque on the abutments and decreases the amount of tipping of the saddle, which better equalizes the pressure distribution over the saddle area.

The vertical slider is an attempt to avoid some of the pitfalls of a hinge type joint. In this type of stress breaker, a matrix or channel exists in the tooth-borne unit which is rigidly fixed to the teeth. The saddle mechanism contains an attachment that can slide vertically in the matrix (Fig. 6, left). When pressure is applied to such a saddle it moves vertically into the tissue and does not tip as in a hinge type device (Fig. 6, right). In this manner the saddle forces are distributed evenly throughout the saddle bearing area and are not concentrated

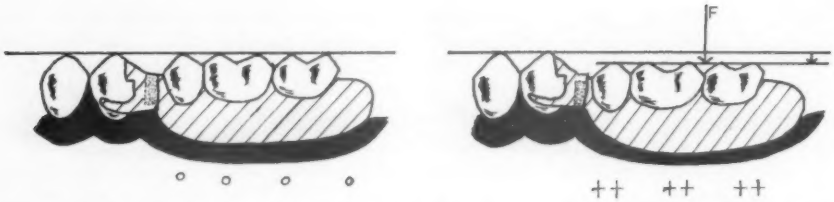

Fig. 6 • Left: Vertical slider stress-breaker partial denture, at rest. Right: Under occlusal force (F), saddle moves vertically, resulting in even compression of saddle mucosa and no clasp movement

Fig. 7 • Flexible connection partial denture of split lingual bar type. A, rigid direct retainer; B, saddle unit

Fig. 8 • Flexible connection partial denture with resilient connection from clasp (A) to saddle unit (B)

Fig. 9 • Flexible connection partial denture with resilient wire of saddle unit (B) attached to rigid direct retainer (A)

at the distal end. This type of joint is difficult to construct for a clasp case and its purposes are most readily achieved with fixed restorations on the abutments and a type of precision intracoronal retainer.

A hinge can best distribute forces if it is located as far anteriorly as possible and at the same height as the alveolar crest. This can be accomplished by fixing the hinge to the retainer at a point just behind the lower incisors and as far gingivally as the lingual tissues will permit.

Those stress-breakers with a flexible connection between the direct retainer and the saddle comprise the third grouping. In this group, as in the preceding one, it is intended that the tooth-borne unit, the direct retainer, be fixed to the abutments as rigidly as possible. The connector between this direct retainer and the saddles is flexible so that under pressure the saddles can move gingivally without movement of the retainer (Fig. 7-9).[39-45]

There are three ways to accomplish this flexible connection. One way is to make the connector between the tooth-borne unit and the saddle of wrought wire, and its flexibility is altered by changing the gauge or length or both of this connector.

The second method is the twin or split bar type technic in which the direct retainer and the saddle each have separate lingual bars which are joined at their most anterior point. This can be done by casting the lingual bar with a horizontal split in it up to the anterior section, with the superior half of the lingual bar part

of the retainer unit and the inferior half of the lingual bar part of the saddle unit. It can also be accomplished by soldering a wrought wire lingual bar which will support the saddles to the cast lingual bar of the retainer unit. The flexibility of this connection depends on the type of material and the gauge of the saddle unit lingual bar or the width of the joint between the retainer and the saddle lingual bars.

The third method to attain this flexible connection is to have the direct retainer and a unit that completely encompasses the saddle area as a unit casting. That part of the saddle that touches the tissues is supported within this encompassing bar by wrought wires which allow movement of the saddle against the tissue without equal retainer movement.[46, 47]

The advantages of stress-breakers are:

1. A balance can be established between the stress-bearing duties of the abutment teeth and the mucosa over the alveolar ridge.
2. Torque, and resultant bone resorption, on abutment teeth is minimized.
3. Intermittent pressure of the saddles against the supporting mucosa may provide physiologic stimulation, which results in stability of the ridge tissues.

Stress-breakers have the following disadvantages:

1. Construction, maintenance and repair are difficult.
2. Too much pressure may be allocated to the ridge area, resulting in bone resorption.
3. Movable units tend to be food collectors and may pinch soft tissues.
4. Indirect retention is difficult to obtain.
5. Many of these appliances are not well stabilized against lateral forces.

CONCLUSION

It is readily observable that the stresses imparted to the hard and soft tissues which bear a distal extension partial denture are many and varied. It is also readily observable that each tissue is constituted differently with regard to its ability to resist those stresses resulting from deglutition, mastication and bruxism. Therefore, it is incumbent on the dentist to design each of these prostheses with an understanding of the stresses to which the tissues will be subject and the possibility of incorporating into the design those factors which might best help the tissue of each individual patient to continue in health.

The patient requiring a Class II partial denture, and particularly the patient with somewhat weakened abutments, needs a partial denture tailored to his requirements and one that incorporates some type of stress-breaking action. Since the ideal stress-breaker does not exist, it behooves the dentist to evaluate the various types and choose that design which will provide his patient with the maximum of masticatory function and comfort with the minimum of damage to the supporting structures.

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Lack of Understanding • Within the Free World itself men whose work lies with the fine arts and the humanities simply do not know what scientists are up to. "I believe," said C. P. Snow, the English writer who is also a scientist, "the intellectual life of the whole western society is increasingly being split into two polar groups. At one pole we have the literary intellectuals: at the other pole the scientists, and as the most representative, the physical scientists. Between the two a gulf of mutual incomprehension—sometimes, particularly among the young, hostility and dislike, but most of all lack of understanding." *Frank Stanton, Stanford University Medical Center Dedication Ceremony, September 18, 1959.*

Surveying for removable partial denture prosthesis

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The removable partial denture requires careful clinical considerations and a mouth prepared to receive it. A path of insertion is surveyed to provide adequate retention of the prosthesis. The technic of surveying is described. The surveyed model is inscribed with outlines of clasps, connectors and saddles and the type of teeth indicated. The model then is sent to the laboratory or dental technician with a written work authorization.

The importance of anatomic and physiologic principles in the construction of partial dentures has been recognized generally. It becomes imperative, therefore, for the dentist to survey his casts before sending them to the laboratory. It is the purpose of this paper to demonstrate the importance of a few fundamentals on surveying for partial dentures and the recommended treatment planning.

A definite plan should be utilized with the guidance of roentgenograms, medical history of the patient, clinical oral examination, study casts surveyed by the dentist, and finally designing of the partial denture on the cast. An authorization should then be written for the technician and sent to the laboratory. This includes the denture design, the type, number, and situation of the clasps, mold and shade of the teeth, and the surveyed cast.

CLINICAL EXAMINATION

Before a clinical examination is made of the patient, oral prophylaxis, polishing of the teeth, and "treatment filling" of all carious teeth should be completed. Visual and digital examinations are then performed. The dentist should have a complete medical history of the patient, full-mouth roentgenograms, both periapical and bitewing, and the study casts. Digital examination is necessary to evaluate the tone of tissues, and the thickness, elasticity and density of the mucosa. It is also important in determining the mobility of teeth and palpating areas where lingual and palatal bars may be placed.

Roentgenograms are studied to determine the bone support of the teeth. Bitewing roentgenograms are of great value, since the periapical views may project bone level in a false position. If bone level is below half the normal support, a tooth usually cannot act as an abutment, and in the case of a molar, if extreme bifurcation involvement exists, the tooth should not be used. The proportion of clinical crown and tooth support is noted, bearing in mind the age of the patient. Shape and length of root are also considered; for example, a root that is flattened mesially and distally can withstand forces that tend to uproot it better than can one with a short and cone-shaped root, as, for example, an upper lateral incisor.

Roentgenograms also may disclose systemic conditions which could have a direct bearing on partial denture prosthesis. Dental granulomas, tumors, and cystic conditions may be seen which preclude the use of teeth so involved as abutment teeth. It is generally agreed that they are poor risks anywhere in the arch where a partial denture is to be utilized.[1]

Vitality tests are required to determine

the presence of degenerating pulp tissues not seen in roentgenograms. Nonvital teeth are used sparingly as abutments. In rare instances, if a choice exists between a partial and a complete denture, a key tooth may require endodontic treatment to preserve it. The brittleness of nonvital teeth and the success of the endodontic treatment are important considerations. The age and physical condition of the patient, extent of apical destruction, accessibility of root canal treatment, and possibility of apicoectomy must be considered carefully.[2]

Oral hygiene is observed and wherever periodontal treatments are indicated, they should be carried out. Where posterior teeth are lost or where the bite shifts to a position of "convenience," splinting or a bite-opening device is suggested to relieve traumatic stress on anterior teeth.

Study casts should be accurate, showing good detail of the abutment teeth and the tissues. Tissue undercuts should be noted for connectors of Class 2 type clasps (Roach), reverse back-action, and ring clasps. Lingual surfaces of the mandibular casts should be examined carefully for tissue undercuts in areas where lingual bars of the partial dentures are to be placed.

Study casts should be marked for alterations suggested by the survey in instances where tuberosities may encroach on the interarch space, and where a torus palatinus or torus mandibularis may prevent proper designing and subsequent wearing of the partial denture prosthesis.

The teeth are examined for caries and the proper restorations indicated. Gold restorations should be placed where gold clasps are used.

MODIFICATION OF ABUTMENT TEETH

The survey for modification of abutment teeth may consider the following factors in connection with crown and fixed bridge prosthesis.

1. The contour of a rotated tooth may need to be modified to provide a better angle for the forces of mastication and for better clasping conditions.

2. Undercuts caused by mesial, distal or lingual inclination of a tooth may need to be modified.

3. Other undercuts should be removed which would interfere with the type of partial denture desired.

4. Broken-down teeth with multiple or large amalgam fillings must be contoured properly for good clasping conditions. Small amalgam fillings may be removed and inlays or three-quarter crowns placed since amalgam margins on abutment teeth tend to chip and break down.

5. Adjacent teeth may be splinted by soldering together their crowns or inlays thus providing added support.[3]

6. Placement of fixed bridges in conjunction with partial dentures may be indicated under the following conditions: (a) when a fixed bridge supplying a missing anterior tooth cannot be incorporated in a partial denture; (b) when a single tooth is present in the center of a long edentulous span.

7. Since improper occlusion may be the cause of abnormal gingival and painful temporomandibular joint conditions, balanced occlusion may be obtained through rectification of extruded, retruded and malposed teeth by the use of crowns, inlays or onlays.

8. In difficult cases requiring many alterations, it may be desirable to mount the study casts on the articulator with a hinge axis face-bow in accordance with centric and protrusive jaw relation records. When bite opening procedures are instituted, it is necessary to obtain a new protrusive record. If a deep overbite presents serious problems, the establishment of a correct centric relation may solve the difficulty to some degree.

9. The proper preparation of abutment teeth for precision attachments is of major importance. Where teeth are mal-

posed, they should be recontoured with full crowns. Pinledges may be resorted to if the dowels are of sufficient length and size.[4] Three-quarter crowns, MOD inlays or full coverage may be indicated, MO or DO inlays are never indicated.

In bilateral tooth-borne partial dentures, the cast is placed on the surveying table and each abutment aligned with the analyzing rod on the proximal surface adjacent to the saddle area. A line is inscribed on the base of the cast for the anteroposterior tilt angle. All four abutment teeth are similarly treated and the resultant angle presented by the most divergent lines is bisected. This line constitutes the final anteroposterior tilt angle, and the cast is securely locked in place. To this is added the lateral tilt angle which is obtained in a similar manner, and the base is inscribed again.

Once all these factors have been examined, the study cast should be inscribed with survey lines, and a design of clasps, connectors, bars, and saddles should be drawn on the model to fulfill the function of the survey line.

SURVEYORS

The first mechanical method for surveying, known as bridge parallelometer, was demonstrated by Fortunati in 1918.[5] At the present time there are many types of surveyors on the market. Some have a fixed horizontal arm around which the operator rotates the table with the cast securely fastened to it. Others have a swinging horizontal arm permitting the use of both hands, one to swing the analyzing rod around the table and the other to rotate the table. The Rententoscope is a complicated surveyor designed to measure excessive or inadequate undercuts. A beam of light is passed through these areas which measures and registers the degree of undercut on a clocklike gauge. It differs from the other surveyors in that the table of this instrument may be raised or lowered with ease.

A list of the parts and a description of a surveyor follow.[6]

1. Platform from which the table moves to any position.
2. Vertical arm which supports the superstructure.
3. Horizontal arm from which the surveying tool is suspended.
4. Table to which the cast is attached.
5. Base on which table swivels.
6. Paralleling tool or analyzing rod together with carbon which is substituted for the analyzing rod to mark the abutment teeth for height of contour. (Kennedy[7] in 1928 first wrote of "height of contour.")
7. Mandrel for holding special tools to measure undercuts, undercut gauges, and also to hold waxing tools for blocking out undesirable undercuts.

SURVEYING

Surveying is a method of inscribing a carbon line on a cast, securely fixed to the table, to outline the greatest diameter in all directions perpendicular to the spindle. It also determines the height of contour of the abutment teeth by treating them as a unit thus permitting a selected and common path of insertion.

The survey line demonstrates a suprabulge above the carbon line (height of contour) which seats the rigid portions of the clasp arms and the infrabulge below the carbon line containing the flexible tips of the clasps. The flexible tips of clasps were described by Prothero[8] in 1916 and De Van[9] used the terms "suprabulge" and "infrabulge" in 1935.

TILT

Once the cast is fixed to the table, the dentist may experiment with various tilts to obtain favorable undercuts for retention. Tilt refers to the inclination of the occlusal plane with respect to the surveying table. The path of insertion is deter-

mined by the location of the saddle areas and by the provision of undercuts where the clasps can be placed on the stronger teeth.

1. A vertical tilt may not provide sufficient undercut areas and will not resist the pull of sticky foods.

2. An anterior tilt with the heels of the cast up is used where the edentulous area is in the anterior portion so as to provide undercuts nearest the saddle area.

3. A posterior tilt with heels down is used to supply desirable undercuts nearest the posterior area where distal extensions are used. This permits the use of a Class 2 type clasp which allows mastication without the heels of the partial denture tipping up. If an adequate survey line cannot be obtained with this tilt, the cast may be tilted anteriorly and Class 1 type clasp used, but it is the opinion of many that a double lingual bar, continuous clasp or finger rests placed anteriorly should be designed to stabilize the lingual bar, thereby obtaining indirect retention by design.

4. If the prosthesis is entirely toothborne, the tilt may be either anterior or posterior, depending on clasping conditions. Using a posterior tilt is advantageous if good clasping can be secured on the strongest teeth. It also permits better esthetics when anterior teeth are to be supplied. The greatest incisal width can be utilized to permit the entrance of the partial denture from the labial side with better proximal alignment.

5. A right or left tilt may be considered in conjunction with the anterior or posterior tilt in order to favor buccal or lingual versions and to increase or decrease the undercuts.

Once the desired tilt is obtained, lines affixed to three sides of the model base or "tripoding" will assure the return of the model to the surveyor at the same tilt.

CLASPING

A clasp is a direct retentive device which encloses at least three quarters of the circumference of a tooth. The terminals of the clasp must contact two opposing surfaces of the tooth. At least one of these terminals must be in the infrabulge area.

The clasp consists of three parts: a supporting portion at the rest which prevents dislodgement gingivally under occlusal stress, a bracing portion which is a rigid part that fits over the survey line (suprabulge) and prevents lateral movement, and a retentive portion which has flexibility and fits below the survey line (infrabulge).

To support the clasp and prevent vertical and horizontal stress, the occlusal rest is seated in a prepared area of the abutment tooth. The type of seat is governed by the tooth substance in which it is prepared. In natural posterior teeth it is spoon-shaped and does not weaken enamel by leaving unsupported enamel rods. In gold restorations it is boxed. When the molars and bicuspids are regarded from the occlusal aspect, the rest seat should come to the transverse ridge and it should deepen slightly there to prevent the occlusal rest sliding out distally. On distal view, the rest seat occupies approximately the middle third of the distance between the two crests.

The rest seats for cuspids and incisors are prepared on their cingulum areas as a rule. Rests should not be placed on the inclined surfaces of cuspids without first preparing V-shaped seats or lateral stress will move the teeth against the labial alveolar wall.[10]

SURVEY LINES

1. The Class 1 survey line is low at the occlusal rest area adjacent to the saddle and high on the opposing side with the desirable retentive area (infrabulge) on that portion of the tooth most remote from the saddle.

A Class 1 type, Akers, clasp is designed to satisfy this survey line (Fig. 1). The buccal and lingual arms are joined at the body portion which lies near the clasp center, and pass obliquely across the suprabulge area into the infrabulge area.[11] This clasp may be modified at the point where it enters into the infrabulge area by turning it on itself to make a "C."

A ring clasp is a modified Class 1 type and is used on molars which stand alone at the posterior of the saddle area and tip lingually in the lower jaw and buccally in the upper (Fig. 2). It is designed with occlusal rests which rest on seats prepared on the mesial and distal aspects of the abutment tooth. Since no undercut area is found on the buccal aspect of the lower molar and the lingual aspect of the upper molar, the clasp passes along the survey line to connect the mesial and distal rests, and engages the mesiolingual infrabulge area of the lower molar and mesiobuccal infrabulge area of the upper molar. It has an auxiliary connector extending from the framework along the mucosa into the distal rest seat on the buccal aspect of the lower tooth and the lingual aspect of the upper.

A back-action clasp is frequently used on cuspids and bicuspids (Fig. 3). It is a long clasp encircling the entire tooth. Care must be exercised in finishing the acrylic saddle to free the acrylic resin from the clasp since this clasp has a long spring arm.[12] It follows the survey line from a connector extending from the framework into a slight distal undercut and continues along the survey line into a greater mesiobuccal infrabulge area for retention. If no distal undercut is present, the tip is carried deeper cervically into the mesial undercut.

The reverse back-action clasp is similar to the back-action clasp except that it has a connector extending from the buccal aspect along the mucosa into the framework and the tip of the clasp engages the mesiolingual infrabulge area.

2. The Class 2 survey line is high on

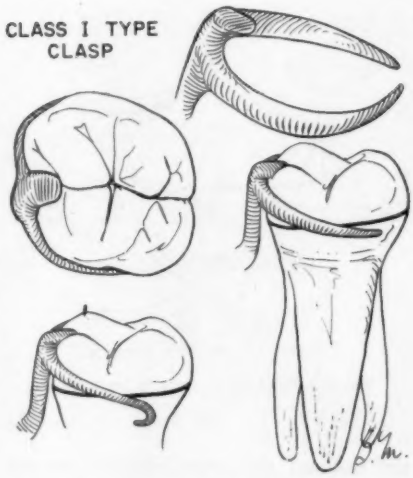

Fig. 1 • Class 1 type clasp

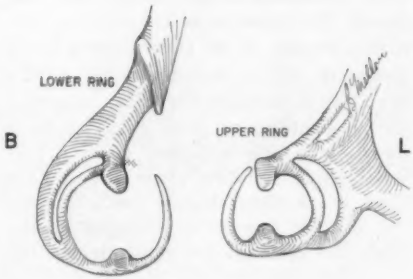

Fig. 2 • Ring clasp

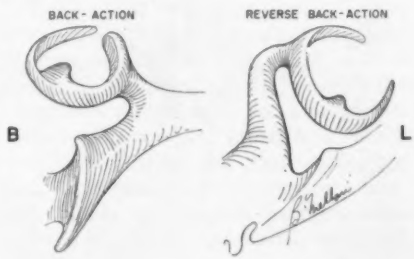

Fig. 3 • Back-action and reverse back-action clasp

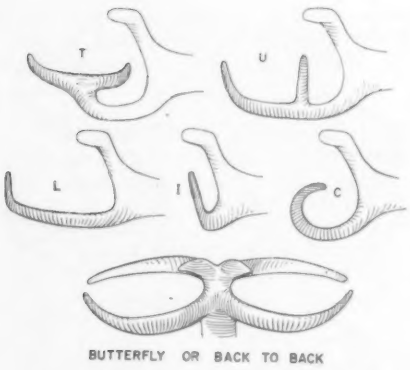

Fig. 4 • Butterfly or back to back clasp

the occlusal rest area adjacent to the saddle and low on the opposite side with the retentive area nearest the saddle.

The use of a Class 2 type clasp or a Roach bar clasp of which the "T" bar is most common is dependent on tissue undercut. The presence of an undercut precludes the use of this clasp since it has a connector which contacts tissue. A "T" bar clasp is designed for distal extension partial dentures so as to keep the heels down. It is also indicated when a posterior tooth, standing alone, may take a Class 1 type clasp, thereby permitting the use of a "T" bar on the bicuspid. In the event the molar is lost subsequently, the partial denture is still designed as a distal extension or free-end saddle prosthesis.

In instances of unfavorable clasping or tissue undercuts, a Class 1 survey line with an Aker clasp is used. To prevent the heels of the denture rising, an indirect retainer may be designed on the lingual surfaces of the anterior teeth such as a continuous clasp, Kennedy bar, finger rests, or a lingual plate or apron. The use of the lingual plate necessitates greater care of the teeth under it. The continuous clasp described by Beach (1924) was used to stabilize a lingual bar and also act as an indirect retainer.[13]

In addition to the "T" bar clasp, Roach also designed U, L, I, C, R, S, and E clasps. He stated:[14]

> The variability of the bar clasps makes it possible to engage the most desirable areas of the teeth regardless of where they are located. . . . It has a firmer yet more flexible grip, less interference with excess convexity and malposition, a wider range of adaptability and greater stability and is less conspicuous. Another important feature of the bar clasp is its approach to the tooth. Because it engages the tooth with a push rather than a pull contact, its grip and stabilizing effect are greatly enhanced.

In distal extension or free-end saddle partial dentures, a Class 2 survey line provides the best retention for a double Class 1 clasp back to back (butterfly

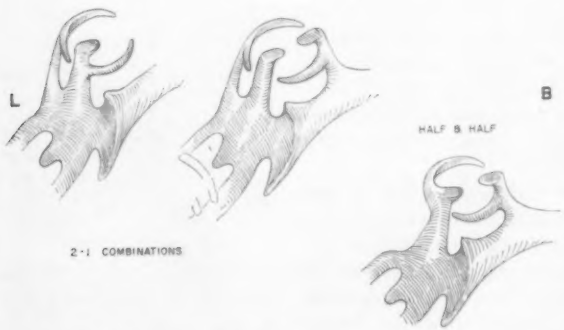

Fig. 5 • Combinations and half and half clasp

clasp) (Fig. 4). A common rest seat is used with a distoocclusal rest on the first bicuspid and mesioocclusal rest on the second bicuspid. Sufficient width is obtained by disking the embrasure to allow the passage of the double arm whenever necessary. This design gives added support and is advantageous where a fulcrum line exists.

Combinations of survey lines 1 and 2 may be employed by designing a split clasp with a T bar on the buccal aspect of the teeth and a Class 1 clasp on the lingual aspect originating either from the mesioocclusal or distoocclusal rest seat (Fig. 5). A half and half clasp may be useful on a single bicuspid with edentulous areas mesial and distal to it.

3. The Class 3 survey line is highest at the occlusal rest area and remains high on the opposite side (Fig. 6). Wrought wire clasps are used since greater flexibility is desired.

Bonwill (1889) was the first to describe the fundamental principles of a clasp. He used a flat plate clasp. Kennedy (1928) believed in employing the "modern" gold wires. Gillett (1923) developed the round wire clasp which he referred to as "modified crib clasp." He also described the torsional and flexure elasticity in clasp construction.

CLASS 3 TYPE CLASP

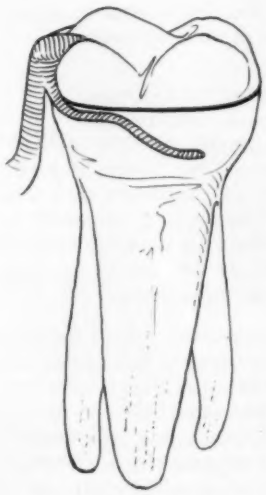

Fig. 6 • Class 3 type clasp

MAJOR CONNECTORS

The major connectors are of two types, rigid and nonrigid.

Rigid Connectors • A rigid connector is used to transmit the masticatory load to the remaining natural teeth, or to divide the load between the remaining teeth and the mucosa.[15]

Lingual bars and palatal bars are rigid major connectors and vary in width and thickness for each individual patient. Rather than fabricate them with too great thickness which may hamper swallowing, a thinner but wider bar should be used. Palatal bars may be single bars, wide or narrow, or divided bars which serve as indirect retainers, or may be horseshoe-shaped. In some instances, to provide more tissue-borne area, it may cover the entire palate.

Nonrigid Connectors • If there is poor bone support, if the mucosa is lacking in density with reduced support, or if complete mucosal support is indicated, nonrigid connectors or stress-breakers are employed.[16]

Since a distal extension partial denture may act as a lever by allowing the saddle to move vertically or horizontally, or may rotate at the crest of the ridge,[17] the broken stress distal extension attachments will afford controlled movements of the saddle by transferring the masticatory load to the mucosa. They permit the free-end saddle to function independently without torque or strain on the abutment teeth.

Kennedy described them as movable

clasps made of interlocking parts of various shapes. The Essig ball and socket attachment,[18] the Dresch[19] attachment and the Ney Chayes attachment are a few examples of nonrigid connectors.

REASONS FOR FAILURES OF PARTIAL DENTURES

Some reasons for failures of partial dentures are (1) unknown undercuts buccally or lingually; (2) undercuts improperly utilized; (3) desirable undercuts not measured, or (4) insufficient undercuts next to the saddle areas.

1. In instances where unknown undercuts are present buccally or lingually, the framework of the completed denture cannot be seated without springing it. This condition exists when lower partial dentures are fitted on teeth which have a lingual tilt or when upper partial dentures are fitted on teeth which have a buccal tilt.

2. Where the undercuts are improperly utilized, the finished partial denture will not seat properly because undesirable undercuts do not permit a common path of insertion. Grinding on the supports or rigid portions of the clasps results in a weakened denture and permits movement of the clasp on the body of the abutment tooth.

3. Where the partial denture fails to remain seated, the tips of the clasps do not engage to the optimum degree the infrabulge area. Normally the denture should seat with slight pressure and be held in place lightly.

4. Where insufficient undercut areas exist next to the saddle area, possibly through improper tilting of the cast during the surveying procedure, tightening the clasps in a lower denture causes the heels of the denture to rise.

CONCLUSION

To guard against failure the prosthesis requires careful clinical considerations and a mouth properly prepared to receive it. A common and selected path of insertion is surveyed to provide adequate retention of the prosthesis.

The surveyed cast is inscribed with outlines of clasps, connectors and saddles and the type of teeth indicated. This cast is then sent to the laboratory or dental technician with a written work authorization signed in duplicate, a copy of which is retained in the dentist's files.

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Complete dentures opposite partial dentures: diagnostic factors

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Diagnostic factors relating to the use of complete dentures in conjunction with partial dentures include evaluation of the two arches, and the significance of the occlusal plane, centric occlusion and incisal guidance. A preliminary examination to obtain the necessary diagnostic aids is necessary. The treatment plan depends on (1) the conditions found in the mouth, (2) the ability of the operator to treat these conditions, and (3) the ability of the patient to pay for modern treatment methods.

The purpose of this paper is to point out and discuss the principal diagnostic factors which have a bearing on the use of complete dentures in conjunction with partial dentures. The direction that technics must go to arrive at a successful diagnosis will be pointed out in general terms; no detailed description will be given of favored methods of achieving these goals.

The title, "Complete dentures opposite partial dentures," may imply some discussion of complete lower dentures opposite partial upper dentures. This treatment problem may occur, but seldom in my experience. A large body of opinion excludes this combination arbitrarily and completely because of the unfavorable prognosis of rapid resorption caused by the occlusal factor on the edentulous lower ridge. This coincides with my belief, although the factors that have been used in the body of this paper would apply equally to either of the two possible combinations, that is, a complete upper denture opposite a partial lower denture, and vice versa.

The following are believed to be the chief factors involved in the diagnosis of complete dentures against partial dentures and these will be discussed in this order:

1. Diagnostic requirements.
2. Diagnostic evaluation of the completely edentulous arch.
3. Diagnostic evaluation of the partially edentulous arch.
4. Diagnostic significance of the occlusal plane.
5. Diagnostic significance of centric relation.
6. Diagnostic significance of the incisal guidance.

DIAGNOSTIC REQUIREMENTS

A preliminary examination to obtain the necessary diagnostic aids is a definite requirement. During this appointment it

is important that "the dentist should meet the mind of the patient before he meets the mouth of the patient. The prospective denture patient should be given the opportunity to tell the dentist what he wants before he is told by the dentist what he needs. For denture ventures to be successful, minds as well as mouths must be individually understood and treated."[1] This examination is for the purpose of obtaining the patient's history (medical, dental and denture), obtaining necessary roentgenograms, profile records or photographs, taking impressions of both jaws, registering a tentative centric relation record, and making a brief and cursory clinical examination to get an initial mental impression of the condition of the soft and hard oral tissues, the occlusal plane, and the condition of the remaining occlusal surfaces.

The patient should be told that this appointment, or appointments, is for the sole purpose of obtaining the records necessary to make a diagnosis and to aid in charting a treatment plan. The dentist might well delay estimating his fee until he correlates his diagnostic findings at a subsequent appointment, for it is possible that complications originally not noticed may be revealed. The necessity of obtaining study casts of the upper and lower jaws, and of mounting these on an adjustable or semiadjustable articulator in centric relation for study, is strongly emphasized.

DIAGNOSTIC EVALUATION OF THE EDENTULOUS ARCH

Roentgenograms • Roentgenograms are studied carefully to observe differences in density, outline and thickness of tissues, particularly of the mucoperiosteum, and to check for the presence or absence of unerupted teeth, root fragments, residual infection, cystic areas and foreign bodies. A dense, closely trabeculated and calcified bone may be considered a more favorable denture foundation than that having a rarefied, moth-eaten appearance. A smoothly outlined ridge with a dense opaque appearance likewise promises fewer adjustments and a more comfortable denture than one with an ill-defined rough outline. The thickness of the mucoperiosteum is noted. In general, a thick uniform mucoperiosteum presents a more favorable prognosis for denture stability than thin tissue. All residual areas of infection should be treated and foreign bodies should be removed before final construction of the denture begins.

Edentulous Cast • The edentulous cast should be examined closely for its individual characteristics and for its size and positional relation with its opposing cast. In general, the smaller the edentulous cast in relation to its opponent, the more difficult will be its stabilization. The position of muscle and frenum attachments is noted. Low attachments prevent flange placement and extension and, therefore, interfere with denture stability. The size, shape and position of tuberosities should be noted. This region can assist greatly in denture stabilization. Surgical removal should be approached with caution, and done minimally only if denture seating and occlusal interferences cannot be accomplished more satisfactorily in another way. The postpalatal (post-dam) seal area should be outlined by examining the cast for landmarks and pressure-probing the soft tissues during the clinical examination. The abruptness of the drop of the soft palate may be evaluated at this same time. If a torus palatinus or very prominent medial suture line is present, its effect on the success of the denture must be determined at this time.

DIAGNOSTIC EVALUATION OF PARTIALLY EDENTULOUS ARCH

The evaluation of the partially edentulous arch should include the following:

1. Size, shape, and position of the arch in relation to its opponent.
2. The remaining teeth.
   a. Number and identity of the remaining teeth.
   b. Presence of caries.
   c. Position of the teeth in the arch both horizontally and vertically.
   d. Vitality of the pulps of the individual remaining teeth.
   e. Shape of the possible abutment teeth with reference to clasping possibilities.
3. Condition of the supporting alveolar tissues.
   a. Periodontal condition of the remaining teeth.
   b. Condition of the overlying soft tissue and bone of the edentulous areas.

Size, Shape, and Position of Partially Edentulous Arch in Relation to its Opponent • The relative stability of the two types of prosthesis must be considered. The complete denture is much less stable than its opponent, the partial denture being stabilized by the remaining teeth. It follows that considerable effort should be made to stabilize the complete denture and to limit the forces that act on the artificial occlusal surfaces. This is accomplished by building the dentures to centric relation and a harmonious occlusal plane, and by narrowing the occlusal table of the natural and artificial teeth of both arches. Any disparity in the size of the two arches increases the problem of how this may be accomplished. Deformities in the shape of either of the two arches likewise complicate the problem. The horizontal position of the two arches can be either an aid or an obstacle to achieving stability of the complete denture. For instance, a prognathic, partially edentulous lower arch can help stabilize the complete denture. On the other hand, the position of the orthognathic mandible tends to drive the complete upper denture forward and thus unseat it.

Number and Identity of Remaining Teeth • The number and identity of the remaining teeth, together with the age, health and psychological attitude of the patient, often are the determining factors in deciding whether the patient is to have complete dentures or a combination of complete and partial dentures. The fewer the number of teeth, the more occlusal stress must be borne by the edentulous regions; therefore, the condition of this edentulous region assumes importance with the lesser number of teeth that remain. As the teeth become fewer, the greater must be their ability to retain and stabilize the partial denture. Conversely, the greater the number of teeth left, the more emergent the diagnosis of fixed partial denture should become. The identity of the teeth is important; cuspids, bicuspids, and molars are the best abutment teeth. Anterior teeth, to be useful as abutments, require alteration of their lingual surfaces and, often, splinting to gain mutual support.

Presence of Caries • The number, size and location of carious lesions of the remaining teeth must be considered. If a large number of carious lesions and restorations are present, the chances are that the nutrition and oral hygiene of the patient require correction. As any partial denture will increase the necessity for oral hygiene, the correction of caries of the abutment teeth should receive the maximum effort consistent with the severity of the caries and the predictable oral hygiene pattern of the patient. Gold crowns often are the best answer for protection from caries and for the repair of existent carious lesions.

Position of Remaining Teeth • The position of the remaining teeth is important in that any gross deviation from the occlusal plane creates corresponding defects in the plane of the artificial teeth in the opposing edentulous arch with resultant occlusal force that will displace the com-

plete denture. This aspect is discussed more fully in a later section of this paper.

Pulp Vitality of Remaining Teeth • Since placing a partial denture on teeth with pulps of questionable vitality could activate the latent infection around such teeth with development of acute apical infections, a determination of the pulp vitality of the remaining teeth is necessary. Strategic teeth (abutments and esthetically important teeth) can and should be saved by endodontic therapy.

Shape of Crowns of Remaining Teeth • The shape of the crowns of the remaining teeth must be evaluated in terms of clasping possibilities. Three possibilities occur: lack of sufficient undercut for clasping purposes; ideal undercuts for clasping purposes; severe undercuts which interfere with placement and removal of the denture. The first of these possibilities requires crowning to correct; the last can be corrected sometimes by judicious grinding, but sometimes crowns must be made.

Periodontal Condition of Supporting Tissues • The periodontal condition surrounding the remaining teeth must be determined by studying roentgenograms, measuring the depth and extent of pockets, and testing the mobility of the teeth. The color, thickness and texture of the gingivae must be observed. The dentist should be alert for evidence of migration of the teeth as a clue to the existence of periodontal disease and abnormal stress. Teeth that are hopelessly involved must be sacrificed (extracted); saving those that remain depends on the extent of the periodontal treatment necessary, the willingness of the patient to assume postoperative care, and the availability of such periodontal services.

Condition of Soft Tissues in Edentulous Regions • The condition of the soft tissues over the edentulous regions of the partially edentulous arch should be observed. In the absence of trauma, flabby ridges must be viewed as an inability of the underlying bone to withstand stress. The dentist should be aware of the probability of tissue deformation in those patients who wear dentures. The tissues should be allowed time to recover before final impressions are taken. Edentulous regions showing severe resorption, particularly if distal extension partial dentures are being planned, call for additional efforts to save the remaining teeth and to correct the occlusal plane of such teeth.

Treatment Possibilities • Modern prosthetic dentistry has added several new treatment possibilities for the partially edentulous arch. Such possibilities result from the (1) modern high-speed methods of reducing teeth for crown preparations, (2) periodontal therapy that results in better control over this disease, and (3) endodontic therapy of greater reliability. Regardless of how it is done, foci of infection should be removed, periodontal conditions corrected, carious teeth restored and faulty occlusion corrected. Modern methods permit saving teeth that otherwise might have to be sacrificed. The treatment plan depends on (1) the conditions found in the mouth, (2) the ability of the operator to recognize and treat these conditions, and (3) the ability of the patient to pay for modern treatment methods.

The use of the three-quarter or the full crown in combination with whatever periodontal and endodontic therapy may be indicated is the principal way whereby near ideal conditions for a partial denture may be approached. Through this combination therapy, ideal clasping conditions on abutment crowns may be produced, ideal rest preparations can be made, tipped teeth may be salvaged for use as abutments, the life of periodontally involved teeth may be extended by splinting and by reducing the forces on each tooth by narrowing the occlusal table,

pulpless strategic teeth may be saved for abutments or esthetic reasons by endodontic treatment, an irregular line of occlusion may be made harmonious, and esthetics may be preserved or improved. This type of therapy often permits the use of fixed partial dentures rather than removable ones. It makes almost axiomatic the use of fixed bridgework in all anterior single replacements and many multiple ones, and often calls for the expanded use of posterior bridgework in others. This type of therapy readily lends itself to increased use of precision attachments and stress-breakers.

This endorsement of modern methods does not imply that diagnosis of the partially edentulous arch can be any less exacting because of these methods. If anything, a more careful evaluation of all diagnostic factors must be made because of the more complicated procedures involved.

DIAGNOSTIC SIGNIFICANCE OF OCCLUSAL PLANE

When a completely edentulous arch is opposed by a partially edentulous arch, an occlusal plane or planes exist. The plane or planes are established by the occlusal positions of the remaining teeth. To this plane, or a more ideal plane created by the dentist, the artificial teeth of complete denture must be set. It follows that only on an ideal plane in the partially edentulous arch can an ideal plane for the teeth of the complete upper denture be created. The ideal position for the remaining teeth is one in which their occlusal position is squarely on a level with a plane that is in harmony with the mandibular movements of the patient. It is not often that such an ideal plane is present in the partially edentulous arch. The greatest single reason for a distorted occlusal plane is migration of teeth due to early loss of adjacent or opposing natural teeth, and failure to replace these lost teeth. Another reason for a distorted occlusal plane is a hereditary growth pattern of malocclusion and jaw formation which has not received orthodontic treatment. One of the most common of these migrations is that of the mesial and occlusal (upward) drift of the anterior teeth of the semiedentulous arch where they are unopposed by the anterior teeth of the opposing arch. The molar that has tipped mesially or drifted occlusally or both is another common distortion of the occlusal plane. It is not uncommon for this migration to be accompanied by periodontal disease. Teeth that fail to erupt completely (infraversion), twisted teeth (torsiversion), teeth overinclined either buccally or lingually (buccoversion or linguoversion) also serve to distort the occlusal plane. It is axiomatic that gross distortions of the occlusal plane must be corrected before dentures are constructed. Failure to correct these distortions has the following adverse results:

1. Incorporates dislodging forces on the occlusal surfaces of the complete denture with ensuing resorption of the supporting alveolus.
2. Causes poor esthetics.
3. Causes dentures to be uncomfortable because of the multiplicity of forces on the occlusal surfaces.
4. Dictates a partial denture that is difficult to insert and remove without trauma to the abutments.
5. Causes a complete denture that is weak in construction because the unnatural position of migrated teeth dictates the use of a plastic base material either too thin or too thick.

Diagnosis involves recognition of the distortion of the occlusal plane and decision as to what corrective treatment methods can be used. Recognition comes from examination of the mouth and the casts on the articulator. In the anterior region at least one or more of the remaining teeth, usually the first and second bicuspids, approximate the anatomical and original occlusal plane closely enough so that these may be used as rule-of-thumb

guides to the proximity of other natural teeth to that line. A mesially tipped second or third molar often can serve as a similar guide to the position of the plane in the posterior region. In the mandible, unsupported molars often tip mesially with little or no vertical eruption. This leaves the distal portion of the occlusal surface of such molars at or near the original occlusal plane. By projecting a plane from the tip of the anteriorly placed bicuspids to the distoocclusal surface of the posteriorly placed molar, an approximation of the occlusal plane can be made. For a distal extension partial denture where no posterior teeth can serve as guides, the retromolar pad must be used as the posterior point of the occlusal plane, as in complete dentures.

The use of the methods described will result in a tentative occlusal plane which will be sufficiently accurate for initial diagnostic purposes. It follows that treatment should be directed to making the individual's remaining teeth harmonize with this plane. This may be accomplished by one of several methods or combinations of these methods: (1) grinding if in supraclusion; (2) orthodontic repositioning; (3) crowning (supraclusion or infraclusion), or (4) extraction. The use of any of these methods is dictated by the condition of the remaining teeth and their supporting tissues, and the willingness of the patient to pay for extended preliminary treatment.

Sometimes none of the remaining natural teeth can be reliably used as points for the establishment of an occlusal plane. In this event, the desired occlusal plane can be created in the edentulous arch using the same landmarks employed in establishing such a plane in complete dentures. In other words, a bite-block is made for the edentulous arch. The anterior point (of the occlusal plane) is established by the use of phonetics, and by lip length and support. The two posterior positions of the plane are determined by using a point 4 mm. below the opening of Stensen's duct in the buccal mucosa. In conjunction with an established vertical occlusal dimension, such a bite-block may be used as a guide for the creation of an harmonious occlusal plane on the lower teeth, the rationale being that those natural opposing teeth that are superiorly placed to this plane are in supraversion to the plane, and that those below the plane are in infraversion.

DIAGNOSTIC SIGNIFICANCE OF CENTRIC RELATION

Regardless of the many phrases used to describe centric relation, it is the point in space from which all masticatory movements originate. Therefore locating this point as the basis for the development of whatever occlusion is desired cannot be overemphasized. The necessity of locating centric relation should not be confused with the controversy that surrounds the significance of mandibular movements. There is no significant disagreement among prosthodontists in having an accurate centric relation from which the myriad of masticatory movements begin. The controversy begins over the practical significance of mandibular movements out of and into the centric relation position.

A minimal technic for obtaining this essential spatial relation is (1) mounting of the upper cast on an adjustable or semiadjustable articulator (this implies a face-bow transfer), (2) obtaining a vertical rest relation (by various means), (3) estimation of the vertical occlusal position and recording this position, and (4) transferring this relation to the articulator. For those who desire the ultimate in jaw relations, the presence of one completely edentulous arch opposed by a partially edentulous arch offers one significant advantage over completely edentulous mouths; namely, the remaining lower teeth can be used to immobilize

a clutch, which in turn can be used to locate the hinge axis precisely.

Failure to obtain an accurate centric relation and incorporation of the resulting errors in the denture create occlusal disharmonies, which result in denture movement, discomfort and subsequent resorption. Because the partial denture opposing a complete denture is fixed and rigid and therefore has little or no resiliency, the probability is that resorption will take place in the resilient complete upper denture over a relatively shorter period of time than if the same error had been incorporated in complete dentures, upper and lower.

DIAGNOSTIC SIGNIFICANCE OF INCISAL GUIDANCE

Five factors should be considered in the arrangement of artificial teeth in a balanced occlusion: incisal guidance, condylar guidance, compensating curve, plane of orientation, and cusp height. When complete dentures are opposite partial dentures, none of these factors is more important for preserving tissue than incisal guidance. It is commonly observed that the close interlocking bite of artificial anterior teeth with natural anterior teeth is a prime factor in causing rapid resorption of the underlying bone of the anterior denture-bearing region. It should be recognized that establishing a more favorable incisal guidance is more within the control of the operator than any of the other factors.

A less traumatic incisal guidance may be established by setting the artificial teeth with sufficient horizontal overlap to obtain a shallow guidance rather than a steep one, and if this is not possible for reasons of esthetics or phonetics, to incorporate cuspid or molar guidances (or both) or risers, which will lift the teeth out of interlocking contacts as soon as eccentric (including protrusive) movements begin. Whatever method or combination of methods is used, it is important during the diagnostic phase that the probable incisal guidance be recognized and then incorporated into the denture.

SUMMARY

This paper has been concerned with those factors that play a significant role in diagnosis and treatment planning when a complete denture is to be opposed by a partial denture. The organization of the paper points out a logical way with which to proceed with a diagnostic plan for this type of case. First the need for an appointment or appointments for obtaining diagnostic records, casts, and relations is stressed. Then the two given components of this type of case are examined; first the completely edentulous arch, and then the partially edentulous arch. The significance of the relations between the two components is then discussed: first, the occlusal plane; second, the centric relation, and last, the incisal guidance.

4531 Cover Street

Paper presented as part of a panel discussion, "Complete dentures opposing partial dentures," American Dental Association, one hundred and first annual session, Los Angeles, October 18, 1960.

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Uniformity • When there's always uniformity of opinion, you'll find that part of the crowd isn't thinking. *Anonymous.*

The functional environment of the teeth

Ira Franklin Ross, D.D.S., East Orange, N. J.*

The term "functional environment" is suggested to describe the health status of the teeth, the periodontium and the adjacent oral mucosa. The functional environment results from all development factors, physiologic mechanisms and pathologic stressors. Later articles will explore in detail each of the three components that influence the functional environment of the teeth.

The concept of the functional environment of the teeth will be discussed in this paper. Later articles will explore in detail each of the three component categories that influence the functional environment: developmental, physiologic and pathologic. It is hoped that this approach will emphasize predisposing as well as precipitating factors as they influence periodontal health. It is also hoped that this concept will place anatomic defects of the periodontium in their proper place. They represent only one of several factors to be considered in the recognition and treatment of periodontal disease. Treatment is incomplete if its only objective is the elimination of anatomic defects.

Many isolated aspects of the etiology and pathogenesis of periodontal disease have been highlighted repeatedly. One school of thought believes that apical migration of the epithelium is paramount. Another emphasizes the activity of the alveolar bone support. Still another believes that the causal factors should be the chief object of attention. A fourth group focuses its attention on anatomic defects such as periodontal pockets, thickened gingival margins, and craters in the alveolar crest.

Of course, each of the foregoing points, as well as several others that could be mentioned, is valid. It would seem, however, that emphasis on only one or two of these aspects presents an extremely limited segment of the total picture. Present knowledge regarding periodontal disease has progressed far enough to show that these various points are only separate parts of the whole problem.

The teeth as they function in their living periodontium, and as they are acted upon by all the associated tissues and organs of the oral cavity, should be the object of study. The dentist must appreciate that the teeth and the periodontium react to chewing, swallowing, speaking, tensional clenching, breathing, kissing, whistling, and all other oral activities. The teeth may shift position, the periodontal membrane may become compressed, and the overlying gingiva may become inflamed as a result of normal and abnormal function. Many other

Table • Résumé of many of known factors that contribute to functional environment of teeth, periodontium and oral mucosa

Functional environment = Developmental factors + Physiologic mechanisms + Pathologic stressors

FE = DF + PM + PS

1. Developmental factors

a. Size b. Shape c. Position d. Morphologic integrity	of	1. Mandible and maxilla 2. Teeth (a) root (b) crown 3. Periodontium (a) gingiva (b) periodontal ligament (c) alveolar bone 4. Temporomandibular joint 5. Oral mucosa including lips, tongue, cheeks, palate 6. Masticatory musculature 7. Salivary glands 8. Blood vessels, lymphatics and nerves

2. Physiologic mechanisms

a. Growth and maturation b. Functional activities c. Reaction to psychologic stimuli	of	1. Mandible and maxilla 2. Teeth (a) root (b) crown 3. Periodontium (a) gingiva (b) periodontal ligament (c) alveolar bone 4. Temporomandibular joint 5. Oral mucosa including lips, tongue, cheeks, palate 6. Masticatory musculature 7. Salivary glands 8. Blood vessels, lymphatics and nerves

3. Pathologic stressors (Miller)[1]

a. Dysfunctional	1. Overfunction 2. Underfunction 3. Oral habits
b. Irritational	1. Deposits 2. Atmospheric irritants 3. Food impaction mechanisms 4. Improper toothbrushing 5. Margins of restorations
c. Systemic	Any systemic component capable of modifying local tissue metabolism 1. Endocrine dysfunction 2. Nutritional disturbances 3. Disturbances of blood and blood forming organs 4. Emotional disturbances

alterations in size, shape, position, and texture may occur. Further, greater understanding of the modifying effects of general metabolic factors on the periodontal supporting structures is needed. A unified concept of all these factors contributing to the health of the teeth and their periodontium is desirable. Such a concept would further our understanding of oral physiology, and of the diagnosis, prognosis and treatment of the structures involved in periodontal diseases.

FUNCTIONAL ENVIRONMENT

The term "functional environment" is suggested to describe the health status of the teeth, the periodontium, and the adjacent oral mucosa. Such a health status

Fig. 1 • Teeth of man, aged 47, with an extremely deep overbite and advanced alveolar bone loss. Patient has predisposition to periodontal disease because of unfavorable developmental and physiologic factors

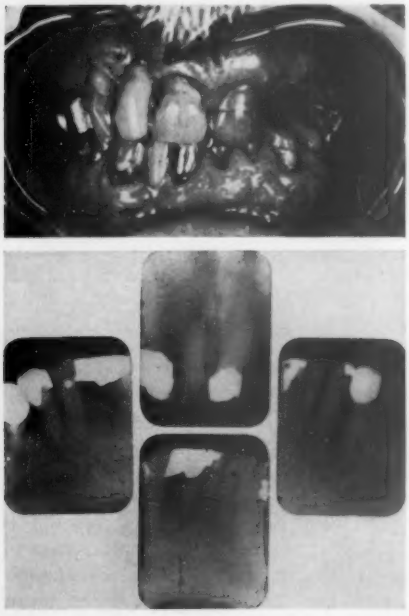

Fig. 2 • Teeth of 82 year old man which have a favorable functional environment despite advanced age, deep overbite and loss of some teeth. There is an inherent resistance of tissue in spite of potentially destructive forces

results from all developmental, physiologic, and pathologic factors. It includes all metabolic changes that result from oral activity during both occlusal contact periods and those periods in which no tooth to tooth contact occurs. The functional concept includes the activities of the teeth, the periodontium, the adjacent oral mucosa, the maxilla and mandible, the temporomandibular joint, and the musculature. It also includes the activities of the lips, tongue, cheeks, palate, salivary glands and their products, the blood vessels, lymphatics and the nerves. These activities include psychologic reactions during periods of emotional tension, anxiety, happiness, and erotic activity, as well as physiologic mechanisms.

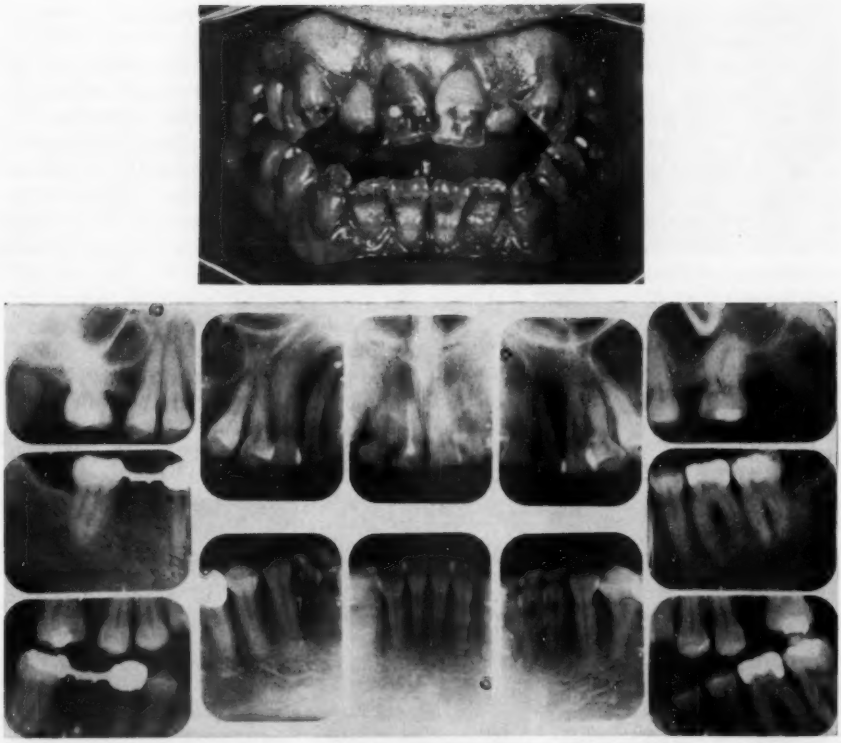

Fig. 3 • Condition of mouth of 36 year old woman. Patient has decided open bite, with no tooth mobility or other evidence of periodontal disease. Roentgenograms show teeth capable of resisting excessive force because of their excellent anchorage

The structures of the mouth react in many ways to various emotional stressors. And these reactions may affect the health of the oral components. There is still another important factor that may contribute to changes in the local environment, the modifying effect of general metabolism.

As Miller[1] repeatedly emphasized, all instances of periodontal disease are the result of numerous causes. He also pointed out that aberrations in function are important contributors to the pathogenesis of these diseases. Alveolar bone loss and tooth mobility are often accompanied by gingival inflammation if calculus or other irritants are present. But tooth mobility and bone loss may also occur in the presence of occlusal trauma with little or no accompanying soft tissue pathologic condition. What do these two findings indicate?

Viewed together, they suggest that both occlusal trauma and soft tissue irritants play important roles in periodontal pathologic conditions. Soft tissue changes such as gingival inflammation, periodontal pockets, and thickened gingival margins are important, of course, in the pathogenesis of periodontal disease. However, these soft tissue changes, as well as the effects of occlusal trauma, must be recognized for what they are—the efforts of the teeth and their periodontium

to adapt to their functional environment. Miller[1] stated further that these soft tissue changes do not represent the entire disease process, but merely the results of causes. The soft tissue changes may themselves become causes and produce more disease as these changes become more extensive and interfere with function. Therefore, the treatment of patients with periodontal disease must include elimination of the causes as well as elimination of the anatomic defects that have resulted.

A résumé of many of the known factors that contribute to the functional environment of the teeth, the periodontium and the adjacent oral mucosa is shown in the table.

DEVELOPMENTAL FACTORS

The concept of the elimination of the causes of periodontal disease, as well as of the results, is not new, nor is the idea that developmental factors and abnormal activity may also contribute to disease. Despite this knowledge, dentists often overlook the basic terrain of the teeth and their periodontium in diagnosis and treatment. The reason for this may well be the eagerness to eliminate causes, such as calculus and occlusal trauma, and the results, such as periodontal pockets, thickened gingival margins and craters in alveolar bone. However, the amount of destruction in a region is the result of the magnitude of the attacking forces (irri-

Fig. 4 • Roentgenograms of 42 year old man with an open bite. The result is opposite to that of patient shown in Figure 3. Advanced periodontal disease has resulted from the deposits of calculus, food impaction mechanisms (producing interproximal decay), and unfavorable root-crown ratio. This represents unfavorable functional environment

tational and dysfunctional factors) as modified by the form and resistance of the structures under attack (Fig. 1, 2). Therefore, the size, shape, and integrity of the teeth, their periodontal support and the related structures determine what the effects of the stressors will be (Fig. 3, 4).

There are many specific developmental factors to consider. The size and shape of the teeth, the position of the teeth, the type of interproximal formation, the type and distribution of the gingiva, the type and amount of alveolar bone support, the size and shape of the mandible and the maxilla, and many other developmental factors enhance or diminish the effects of the irritational and dysfunctional stressors. The developmental factors as well as the physiologic mechanisms and the pathologic stressors will be discussed in greater detail in later papers.

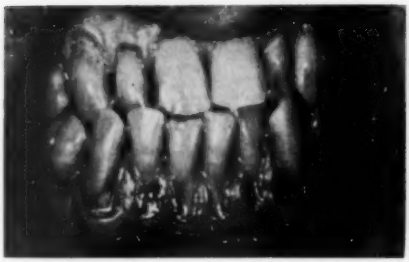

Fig. 5 • Condition in mouth of 48 year old man. Cross-bite and calculus deposits were present. The prognosis for these teeth will become more favorable after functional environment is improved which may be achieved by improving occlusion, by scaling and curettage, and by improving home care

PHYSIOLOGIC MECHANISMS

Optimum function of all oral components is also important in maintaining maximum health. Physiologic activity implies that growth, maturation, and function of all the parts occur within acceptable limits. Tissue anabolism either exceeds or is equal to tissue catabolism, however, when tooth mobility, gingival inflammation, pocket formation or alveolar bone loss occur, the activity has exceeded physiologic limits and has become pathologic in nature (Fig. 5). An obvious example of a physiologic mechanism is the growth and maturation of the gingiva, periodontal ligament and alveolar bone.

Another important physiologic mechanism is adaptive tooth movement. This

Fig. 6 • Teeth of 74 year old man with favorable functional environment. A cross-bite is present and minimal calculus formation. Patient has some periodontal disease but less than would be anticipated from this type of malocclusion and chronic irritation. Despite advanced age and lengthy history of trauma, mobility of anterior teeth decreased after scaling, curettage, and the reduction of trauma by grinding. Condition in this man should be compared with condition shown in Figure 5

Fig. 7 • A man, 78 years old, has favorable functional environment in spite of chronic toothbrush abrasion

includes buccolingual rocking and mesial, distal, buccal, or lingual movement as a result of intercuspal contacts and muscular activity. It also includes reactive positioning. This refers to the movement of a malposed tooth after removal of the forces that produced the malpositioning. Reactive positioning results from the combination of continuous eruption of teeth, interocclusal contact and muscular activity. When reactive positioning does occur, the tooth moves without the aid of an appliance. If the tooth moves because of the use of an appliance, the movement is called exogenous tooth movement.[2,3]

Other important physiologic mechanisms are salivary production and control, muscular activity during mandibular movement, and oral bacterial activity. To summarize briefly, the periodontal tissues mature and grow, the teeth move in their sockets; the mandible assumes a variety of relationships with the maxilla as a result of muscle activity, and the salivary glands secrete their fluids. Normal activity of these various components promotes health (Fig. 6, 7). Abnormal activity produces disease.

PATHOLOGIC STRESSORS

The final factors contributing to the functional environment are the pathologic stressors. Miller[1] divided the causes of periodontal diseases into dysfunctional, irritational, and systemic factors. He pointed out that dysfunctional factors

apply to occlusal overfunction, to underfunction, and to abnormal occlusal habits. This latter group, the abnormal occlusal habits, has been extensively described by Sorrin.[4] Irritational factors apply to the various types of deposits, food impaction mechanisms, and faulty dental restorations that injure the periodontium. The systemic group includes any type of systemic disturbance that can produce increased tissue destruction in the supporting mechanism of the teeth. Included in this group are disturbances of the endocrine glands, nutritional defects, aberrations in the blood and blood-forming organs, and emotional disturbances.

SUMMARY

1. A unified concept of the known factors that contribute to the health of the teeth in their periodontium is desirable. Such a concept would aid in understanding of oral physiology and of the diagnosis, prognosis, and treatment of the involved structures in periodontal diseases. In addition, this concept would emphasize the functional activity of the teeth in the periodontium.

2. The term "functional environment" is suggested to describe the health status of the teeth, the periodontium, and the adjacent oral mucosa. The functional environment results from all developmental, physiologic, and pathologic factors. FE (functional environment) = DF (developmental factors) + PM (physiologic mechanisms) + PS (pathologic stressors).

The developmental factors refer to the formation of the teeth and the various elements of the periodontium. These factors include the shape and arrangement of the teeth and the development of the gingiva, the cementum, periodontal ligament, alveolar bone, maxilla and mandible, oral mucosa, oral musculature, temporomandibular joint, tongue, and salivary glands.

The physiologic mechanisms refer to the functional activities of the teeth and of all the elements that support them. These mechanisms also apply to the functions of all other structures of the oral cavity that contribute to periodontal health. Among such structures are the salivary glands, oral musculature, and the blood vessels, lymphatics and nerves.

The pathologic stressors include those dysfunctional, irritational and systemic factors that produce destructive changes in the supporting structures of the teeth.

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The Morality of Research • When the value of a treatment, new or old, is doubtful, there may be a higher moral obligation to test it critically than to continue to prescribe it year-in-year-out with the support merely of custom or of wishful thinking. *F. H. K. Green. The Lancet, April 26, 1958, p. 902.*

Psychosomatic formulations in dentistry

Sanford M. Lewis, M.D., Newark, N. J.*

In contrast with the physician, the dentist is more likely to represent symbolically the punitive rather than the protective father. It would be better if the dentist greeted his patient for the first time in a room which is nonclinical, wore an ordinary jacket, and sat in a chair at the patient's level. The more that the dentist can explain about every step, the less fear will result. If the image of the man with the drill can be replaced by the image of one who listens and helps, the rewards will be great both for the dentist and his patients.

As one observes the spectacular advances in diagnosis and therapy of disease which have characterized the past 20 years, he may be awed by the rapidity with which new doctrines and concepts have become integrated into practice. We deal familiarly with steroid chemistry, endocrine physiology and antibiotic complexities. Our preprofessional education apparently endows us with sophistication in many scientific disciplines, and all patients benefit because we are able to translate research promises into therapeutic realities.

And yet there is an area of the healing arts in which progress is less commendable. We speak with condescension about the difference between men and beasts. The latter we describe as complex anatomical and physiological organisms with only the most rudimentary set of emotional responses. But man, we boast, has a system of feeling patterns which, *in toto,* endow him with what we call "humanity" and which we seem to suspect should be taken into consideration when he is sick. Having said so, we relax confident that we are "psychiatrically oriented" and will know just when to offer an extra few moments of our time for the patient's "ventilation" or extend a paternal pat on the head known scientifically as "supportive psychotherapy." A famous doctor once remarked, "The great error of our day is that physicians still separate the mind from the body, psyche from soma." In the several millenniums since Plato's era, we have barely succeeded in eliminating a hyphen.

A CONCEPT OF NEUROSIS

If we ask ourselves, "Why the startling lack of interest and understanding about emotional phenomena in otherwise intelligent medical men?" we come to grips immediately with one of the major mechanisms in the formation of neurotic structure. This mechanism is known as defense. If there were nothing to fear—ever—there would be no such word in

the language. But from the moment a new being comes into perceptual life, and this may even be intrauterine, circumstances combine to interfere time and time again with the comfortable perfection of utter dependency and sublime omnipotence. The womb and later the cradle are equated with "mother," who equals satisfaction and fulfillment. The relationship which characterizes this interaction becomes known as Love. Thereafter, throughout our lives, we react in a thousand ways to the loss of love or, more accurately, to the threat of deprivation.

The most primitive reaction is the one most commonly referred to as "anxiety." This is a generalized response employing the vegetative nervous system. It constitutes a syndrome which is more or less completely familiar to everyone, both subjectively and objectively. As we rally the defenses so important to maintaining our equilibrium in a world which cannot be all-giving and all-loving, we begin to convert anxiety into other phenomena, sometimes constructive and socially acceptable, sometimes terribly destructive and tragic.

In his earlier formulations, appearing during the 1890's, Freud[1] spoke about the "defense neuropsychoses." A neurosis, he postulated, is the ego's defense against feelings intolerable to it. Thus the ego attempts to deprive the intolerable idea of its emotional charge, its affect, making it weak thereby. This build-up of emotional power is known as libido. The nature of the neurosis which ensues depends upon the way in which this is handled.

It might be helpful to postulate a simple and classical example. The child loves mother and is, perhaps because mother is basically an inadequate or rejecting parent, constantly fearful of the loss of her affection and approval. Father presents a threat, because he alternately abuses mother, thereby awakening fear in the child of her death, and caresses her, making his son feel that he will be excluded. Father then is a rival and, no matter that he is also a friend and protector, someone to be wished away, disposed of, "killed." The presence of ambivalence, and feelings are rarely pure or simply directed, adds to the confusion. The child's feelings are strong, and just as in the original story of Oedipus Rex, equally intolerable. How may this be handled?

When the impulse to strike or kill arises and the emotional energy connected with it meets the censorship of the super-ego, it may be converted into bodily expression. Thus in simplest form, we may find a paralysis of an arm or a leg. Here the solution or defense is "hysterical," and we are dealing with a reaction we now refer to clinically as "conversion hysteria."

Suppose instead it is the nature of this particular mental organization to substitute a less tolerable but equally energy-consuming idea. Then we may encounter the repetition compulsion, the hand washing of Lady Macbeth, the endless ritualization which on a wider scope characterizes the personality of the compulsive. This is the individual who cannot be comfortable unless everything is just so. His desk must be clean, his appointments must be kept ten minutes early. This resolution we know as obsessive-compulsive behavior.

In personality structures which are perhaps more fragile and less integrated than others, the intolerable idea may be handled only by substitution of something equally intolerable but less personally significant. This is the source of phobias which have tremendous power and tenacity reflecting the great emotionality of the underlying conflicts. There is little wonder, therefore, that the phobic cannot be "talked out" of his fear with patient logic. His actual difficulty has nothing to do with the particular overt problem he presents, and nothing can make him give up the (unconscious) protection provided against the far more threatening ideas within.

There are other ways of displacing the energy represented by unconscious and unresolved conflict. If stimuli originating in the psyche can be transmitted to strategic endocrine organs, such as the hypothalamus, the pituitary, the adrenals, a chain of events can be set up which will eventuate in target organ responses. There may be hypermotility of the gastrointestinal tract, spasm of the bronchi, changes in caliber of cerebral vessels or grinding of teeth and hypersecretion of saliva. Here is introduced a physiological bridge between psychic disequilibrium and organic response which has come to be known as "psychosomatic disease."

And finally, there is always one more alternative. In dealing with any of these other phenomena, we must always bear it in mind, since the abrupt, thoughtless or sadistic removal of other defenses may precipitate the final one—that of complete withdrawal from the conflict and from reality. In other words, psychosis. Much has been said about the equivalence of psychosomatic disease, for instance, and psychosis, the former being a more acceptable alternate of the latter.[2] The literature is full of examples in which the patient, stripped of his psychosomatic defenses, has deteriorated into a psychotic withdrawal invulnerable to the logic of negative roentgenographic studies and normal blood values. Neurosis, then, in the earlier theorizing of Freud and his contemporaries was a defense or a repression. This defense existed against unacceptable, usually sexual ideas. It was an unconscious process.

What has already been discussed about the nature of neurosis is classical, fairly well-known and more or less accepted by many in both scientific and nonscientific circles. Perhaps less well appreciated, however, is the fact that Freud was constantly changing his theories, rewriting and reformulating. As a result, by the 1920's he was describing neurosis from a considerably more expanded point of view. His later comments are far more compatible with today's psychoanalytic thinking.[3]

In the intervening years, a great deal had occurred. Schilder[4] had written about the "body image." Freud himself had studied narcissism, and Fenichel[5] had amplified his thinking into a detailed analysis of the "self." Bergler[6] and Theodor Reik were writing about masochism, the voice of accusation, the keeping in training for suffering (deprivation), and everyone was exploring the complex functioning of the ego and of the superego.

In the earlier formulation, Freud had concerned himself with the repressed conflict, libido, and its drive for externalization in one way or another. In other words, the emphasis was on the id, the area of primitive urges and drives. Now having become more acquainted with the fundamentals of ego psychology, which Anna Freud[7] has since beautifully elaborated, Freud began to look at neurosis in a somewhat more evolutionary manner. To summarize briefly, the old idea was that repression resulted in accrued libido, which created anxiety until it was discharged. In the newer thinking, anxiety was thought of as a signal that internal or external danger exists, a danger with which the psyche cannot cope and which therefore causes it to be threatened. Anxiety is thus a preparation for and anticipation of the dangers to come.

And this has tremendous therapeutic implications since we are now less concerned with the dramatic unveiling of the repressed conflict, which so often defies exploration except in detailed psychoanalysis, and we are able to emphasize instead the reduction of anxiety by strengthening of the ego. The psyche is therefore prepared more satisfactorily to deal with the threat. And if the threat is realistically too big, then there must be a conscious plan to circumvent it. An emphasis on reality can be a potent therapeutic tool.

PSYCHOSOMATIC DENTAL PROBLEMS

There is little question about the fact that dental practitioners are working in an area which possesses possibly more symbolism from a psychodynamic point of view than any other segment of the body structure. There may be some who would defer to the urologist in this regard, and it will certainly be conceded that both he and the gynecologist come in a close second. Not far behind, perhaps, is the proctologist, but if we recall the earliest primitive functions with which the mouth is associated, we can understand how important it becomes in the formation of early ideas and attitudes. The first active contact that the infant makes with his environment is through the sucking mechanism. The mouth becomes his first avenue of satisfaction and, in so-called "oral personalities," this avenue retains its predominance throughout life. This term is applied to one who is "on the take," attempting constantly to incorporate the world and its treasures unto himself. He is in sharp contrast with the so-called "anal character," who tends to be rigid, suspicious and selfishly retains within him whatever he feels to be of value. In earliest life it is, of course, his feces which later becomes equated with money and possessions.

Thus the most archaic form of satisfaction occurs through the mouth. This is carried out later in the kissing process. On the other side of the picture and almost as important as the receiving of satisfaction is the expressing of hostility. The teeth with their aggressive biting function are the archetypes of the tools of anger. The cornered animal bares his teeth to show his rage. The infant bites with impunity when thwarted. A patient treated recently spoke of a panic reaction which occurred whenever she saw her mother chewing. It was not until a good deal of unconscious material had been ventilated that she was able to understand that this panic resulted from constant fear of her mother's disapproval and, in fact, active punitive aggression. Eventually she understood that the act of chewing was for her indicative of anger and attack. This was something she could not tolerate on the part of her mother.

Also significant is the position of the teeth and mouth as the focal center of the entire physiognomy, the facial appearance of the patient. How one looks is not nearly as important as how one thinks one looks. Our "body image" has so much to do with our "self image," which is just another way of saying, "The way we think we look has so much to do with the way we think we are." All of us are certainly familiar with the impact of unfortunate body image on personality structure. The person who likes himself, and this is quite different from conceit, is rarely sick.

Certain oral deformities, such as decayed and unpleasant looking teeth, prognathism, receding chin and other malformations of occlusion, can result in feelings of inferiority and insecurity. I am not a dentist, but I feel quite sure that most people with artificial teeth are far more concerned with their appearance than with their masticatory efficiency.

Possibly the outstanding manifestation of emotional difficulty from the point of view of the dentist is bruxism. Whether produced by frustration, anxiety, tension or repressed hostility, this recurrent activity can lead to periodontitis or temporomandibular joint pain. In a study performed by Kydd[8] at the University of Washington on 30 patients with temporomandibular joint pain, 76 per cent showed unequivocal evidences of emotional disturbance. In almost all of these, it was possible to point out a relationship between exacerbation of symptoms and difficulties in personal or social adjustment, indicating conflict and anxiety. An interesting case report refers to a 35 year old woman who was seen by her physician because of cervical adenopathy. Patient listening evoked the information

that the sufferer was in the habit of suppressing outbursts of emotion by means of clenching her teeth. She awakened in the morning with a sore tired feeling in the region of the temporomandibular joints. She was able also to relate that she invariably clenched her teeth when picking up one of her children. This tensing action therefore, was somewhat pleasant and had something to do with pleasure in hugging the child. The apposition rather than opposition of sadism and masochism is a common finding in psychiatric exploration. In this case, after careful exclusion of organic difficulties, it was possible to reassure the patient, help her to understand the mechanisms of her difficulty, and to suggest an ingeniously harmless substitute for her bruxism. It was suggested to her that she press her lips together rather than her teeth under the circumstances described. The psychosomatic approach, however simplified in the retelling, produced a satisfactory result where more conventional organic methods might have failed.[9]

Perhaps no field of dentistry is more concerned with emotional factors than orthodontics. Not infrequently those who are undergoing such treatment are in the preadolescent or adolescent periods of their lives when a multitude of stresses already prevails.[10] Nowhere does the question of body image become more important, and nowhere must a therapist be more perceptive and sympathetic in his approach. If, while the teeth are being straightened, the ego is being bent, the entire validity of the process comes into question.

ATTITUDES TOWARD PATIENT MANAGEMENT

The physician or dentist is, for the patient, an authority figure who is looked to for help but is also a source of fear and anxiety. If he wears a clinical looking white coat and is visualized always in a room full of awe-inspiring machinery, then the fear associations tend to overshadow the more pleasant ones. To add fuel to the fire, if we now place our dentist in a position of physical supremacy so that he is always towering over the seated or semirecumbent patient, the image of the aggressor rather than the healer certainly gains in dominance. Finally, if we add the ultimate insult of effectively cutting off the patient's means of oral communication after the first perfunctory greeting, then we have hostility added to fear, and the total situation is one far from ideal for the beginning of a successful therapeutic endeavor.

For these reasons, and because the conventional approach described in somewhat exaggerated terms is not conducive to a free expression of his feelings on the part of the patient, it seems highly desirable that the dentist begin his therapy in quite a different way. Most physicians have consulting rooms. Many dentists do not. If the patient is greeted for the first time in a room which is nonclinical in appearance, by a dentist who may perhaps wear an ordinary jacket and be seated in a chair at the patient's level, some of the restrictive factors mentioned are less likely to serve as blocks to communication and as stimuli to increased fear. In this initial interview, it is obviously of value to let the patient talk. We are, of course, less interested in what he says than in why he says it, and we must learn to become perceptive in recognizing the verbal and nonverbal clues which point up the significant material. Having had a chance to talk and perhaps having obtained assurance that his dentist really understands his problems, the patient will enter the experience in a far more relaxed and optimistic fashion.

If this first meeting can also serve as a mutual planning session, then the patient may feel he has a part in the process and is less likely to feel himself a virtually helpless onlooker. Criticism, dissatisfaction and even accusations of malpractice are much less likely to occur when the

patient thinks of himself as a partner in the therapeutic process. Particularly in children, but also in adults, the more that can be explained about every step of the way, the less fear will result. Some of us are in the habit of dealing with children by means of subterfuge. We promise them that "this won't hurt" and then go on to perform a procedure which would agitate a Prometheus. If the child is told instead "this will hurt a little but it will be over in just a moment," he can respect and believe his doctor and relax during the 99 per cent of time when he may truthfully be assured that no unpleasant sensations will be felt.

A question inevitably arises concerning ways and means of acquiring the know-how involved in extracting significant material which is buried somewhere in the patient's story. There is no easy answer. Some of us are more perceptive than others. This endowment, however, is not enough. We do not permit unskilled hands to enter an abdomen or extract a tooth. We cannot expect the uninitiated to make a satisfactory psychodynamic evaluation with one or two interviews. The answer exists only partly in reading and the taking of courses. Certainly a good deal can be learned. Nothing, however, replaces the opportunity for actually interviewing patients from an emotional point of view under the guidance of a supervisor. Close behind this in efficacy is the observation of interview technics with explanatory comments afterwards, such as through a one-way glass or similar concealing device. Dental educators and those who influence them have perhaps an obligation to insist that training of this kind become an integral part of the curriculum. It is just beginning to occupy a significant place in medical school planning. Here, too, there is a long way to go.

Finally, I would like to advance a thesis which to me seems fundamental in any consideration of psychosomatic dentistry. A hypothetical dentist, perhaps a little larger than life, has been described herein as he might be seen by many of his patients. This is an unfortunate image. In contrast with the physician, the dentist is more likely to represent symbolically the punitive rather than the protective father. Modifications in conduct of the initial interview have been suggested as one means of mitigating this difference. There is, I feel, another. It has always been a little difficult to understand why dentistry as such must be so deliberately segregated from medicine. There is a far closer relationship, it appears, between the dentist and otorhinolaryngologist than between the radiologist and neurosurgeon, and yet the latter are banded together under the heading of medical practitioner whereas the former occupy distinctly different professional positions. It is true that more dentists are becoming part of the hospital family, but even these are set very much apart and rarely have more than superficial contact with the rest of the therapeutic team. It appears evident that both medicine and dentistry might be enriched by an integration of the disciplines, so that the dentist becomes, in fact, just another medical specialist. Certainly if more of his initial training is medically and psychiatrically oriented, he will actually be a physician specializing in the treatment of oral diseases.

Changes such as this must, of course, be many years in the making. In the meantime, however, if the image of the man with the drill can be replaced by the image of one who listens and helps, then the rewards will certainly multiply both for the practitioner of dentistry and his patients.

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Relation of the general practitioner of dentistry and the orthodontist

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The role of the general dental practitioner in regard to orthodontics is a preventive one. The family dentist is in the best position to see the developing malocclusion. Procedures for referral should be worked out between the general practitioner and the orthodontist.

Cooperation between the general practitioner of dentistry and the orthodontist (or any other specialist) is essential for the best care of the public. Problems, however, sometimes arise. It would seem, after a review of the literature and consideration of personal experience, that the following quotation shows the problem clearly:

"The demand for orthodontic treatment is increasing more rapidly than orthodontists are being produced. It follows, then, that general practitioners themselves must undertake more of the simple treatment problems in order to allow the specialist to concentrate on the complicated cases. When a minor occlusion problem presents itself, the general practitioner should attempt to handle it. If some help is needed in diagnosis or appliance design, an orthodontist should be called upon for help. This assistance is recognized as one of the orthodontist's responsibilities, and he will be willing to give it. Over a period of time, a dentist can become very skillful in treating minor orthodontic problems to the benefit of his patients, his cohorts and himself."[1]

There is no argument with the initial statement; a great demand for orthodontic treatment certainly exists and in some areas the demand is greater than the supply. However, since the demand for general dental services is equally as great, and since there is a growing shortage of dentists, one can wonder if the suggested solution is logical even if it were practical. Who is going to supply the general dental care while general practitioners are busy helping the orthodontist by caring for the so-called simple orthodontic cases? Furthermore, how will the orthodontist find time to treat the complicated cases when he is busy diagnosing cases and designing appliances for the general dental practitioner?

Finally, I wonder what a simple ortho-

dontic case is. Certainly each case warrants all the diagnostic ability that the trained orthodontist has at his command.

Most orthodontists and general practitioners agree that the role of the general dental practitioner in regard to orthodontics is a preventive one, and most dentists are aware that there is much to be done in that area.

Certainly the orthodontist is willing to give advice. However, he objects to being shown a cast of upper or lower teeth and asked for a diagnosis on how to correct such and such a tooth, or being called on the phone and asked for a diagnosis from the dentist's description of a single roentgenogram. The orthodontist wishes to be helpful, but many times he finds himself in a difficult position. If he refuses, the general practitioner may think he is trying to make a big case out of every consultation, and if he tries to advise with such scanty diagnostic material, he knows he may cause irreparable harm.

Even such a "simple" procedure as space maintenance is not just a question of placing an appliance wherever a deciduous tooth has been lost. In many instances no space maintenance is required. I have seen space maintainers placed where the space already has been three-fourths closed by forward drifting of a first permanent molar and where ultimately the extraction of four first bicuspids and full orthodontic treatment would have been indicated regardless.

Salzmann[2] lists at least four specific instances in which space maintainers are not indicated:

1. Where there is no bone overlying the crown of the erupting permanent tooth and its root is about one-third calcified.

2. When the space left by the prematurely lost deciduous tooth is in excess of the mesiodistal dimension of the permanent successor as shown by measurement on the roentgenogram and where the space shows no sign of closing.

3. When opening or retention of space is contraindicated because of a generalized lack of growth of jaws and where space maintenance would further complicate existing malocclusion.

4. When the succedaneous tooth is absent and space maintenance is not indicated to preserve general occlusion and permanent dental relationship.

Another condition in which many factors enter into the diagnosis is diastema. Every case of spaced upper central incisors in the early mixed dentition is not an indication for frenectomy. In most instances diastema is a normal transient condition which usually corrects itself with the eruption of lateral incisors or cuspids.

Further, serial extraction is not indicated in every instance in which the lower permanent incisors are crowded and the deciduous cuspids are crowded or blocked out.

Serial extraction, improperly handled, may complicate and lengthen treatment unnecessarily. Following are a few of the pitfalls:

1. The buccal segments may drift mesially into the extraction space, closing the space and blocking an unerupted cuspid.

2. The incisors may tip lingually more than necessary.

3. Undesirable midline shifts may occur, making extra work during treatment.

4. Overbite may deepen.

5. More space may be available than is needed.

Extraction of a lower incisor to correct crowding may cause lingual collapse of the lower incisors followed by crowding of the upper anterior teeth which may have been perfectly straight.

Each case, whether it involves space maintenance or a complicated arch length deficiency, must be diagnosed properly.

Naturally the family dentist is in the best position to see the developing malocclusion. The patient is under his constant observation, and he has the oppor-

tunity to watch the entire developmental process. He is able to determine if deciduous teeth are lost at the proper time in proper sequence and if permanent teeth erupt as they should. The normal dentition is familiar to him and any deviation should be obvious.

One of the questions uppermost in the family dentist's mind is "when should this child begin to receive orthodontic treatment?" There is no set age for starting treatment. The starting time varies with the child's condition and with the orthodontist's method of treatment. Some orthodontists treat during the early mixed dentition, some during the late mixed dentition, whereas others may wait until the permanent teeth including second molars have erupted. Therefore, the best rule would seem to be to refer the patient whenever a departure from normal becomes apparent. Then each orthodontist can follow through according to his beliefs.

What then is the procedure for referral? This again is something that varies. The general practitioner and orthodontist should work this out between themselves. If full mouth roentgenograms are available, they should be sent to the orthodontist. The parent or patient should be informed that the orthodontist normally will have to obtain certain information before a proper diagnosis can be made. This may require taking various types of roentgenograms such as intraoral or lateral jaw views or cephalometric roentgenograms. Impressions for study casts may be taken and photographs may be made. There can be no definite rule about this, because some steps may be left out if not considered necessary by the orthodontist, or the whole procedure may be postponed until further clinical observation.

The urgency of the situation should be made clear, but the patient should not be alarmed by a statement such as, "This is the worst case I've ever seen; treatment should be started right away." The orthodontist might want to wait a while. Again, a remark such as, "This is a simple case; it shouldn't take long to correct" may well be left unsaid. Sometimes the general practitioner is overanxious that the patient seek immediate consultation, and he makes such an offhand remark, but often more harm than good may be done because the patient's confidence in the profession is shaken by the apparent conflict between the family dentist's remarks and the orthodontist's recommendations.

The dentist and his aides should not discuss the child's condition in front of the child or parent unless the discussion is based on positive knowledge. Casual remarks that may or may not have bearing on the case should be avoided. To the patient, dentists are experts, and casual remarks are taken as expert opinion.

Statements such as "He can be treated at age 12 or 13" should be avoided. There are no general rules about age. Each orthodontist has his own rules, and each child's condition is different. Furthermore, chronological age is no guide to dental age; that is, one child age 10 may have his permanent dentition (minus third molars) whereas another, age 13, may still have a mixed dentition. Both may be normal.

What then can the general practitioner answer when patients ask about length of treatment, severity and type of malocclusion, the type of appliances that will be used, cost of treatment and so forth? Once again, since each case is an individual problem, the patient should be so informed and told that only after the diagnosis and final evaluation by the orthodontist can definite statements be made.

Finally, the patients should be informed that the orthodontist concerns himself only with correcting the malocclusion and that the general practitioner will continue with the patient's general dental care.

Further problems arise when the orthodontist starts treatment. Many times

the roentgenograms reveal carious teeth that should be restored. The patient has just had his examination by the general practitioner and believes his work complete. The orthodontist should explain that certain areas should be checked by the family dentist before banding, that it would be all right to leave these areas untreated if the teeth were not to be banded, but that they should be protected by restorations since the bands are going to be in place for some time. Then a note may be sent to the general practitioner asking him to check these areas. If the general practitioner is sure that the patient is about to seek orthodontic consultation, it would be wise to postpone dental work until an appointment after the consultation, because teeth may have to be extracted and unnecessary restorations may be avoided.

When orthodontic treatment is completed, the general practitioner's roentgenograms may reveal some root resorption, or decalcified spots may appear on the enamel. Some of this is unavoidable. The situation should be handled with tact and perhaps discussed with the orthodontist.

In conclusion, I will quote deVries,[3] who makes clear the role of general dental practitioner and orthodontist:

> . . . the general dentist is the watchdog of the dental health of the families whom he serves. As internists discover the early beginnings of organic troubles which require surgery for the final correction, so do dentists have the opportunity and obligation to discover the beginnings and progress of dental malocclusions. The general dentist should never be deprived of the right and privilege to do this. Whether he feels competent or wishes to engage in the correction of malocclusions is his own prerogative. However, he definitely is in the role of supervisor of the entire dental health of his patients and they will always look first to him for advice. Only by abusing this privilege through inaccurate and irresponsible diagnosis, casually rendered, and failure to assume his proper professional stature will he ever lose it. He should guard it zealously.

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Monuments of the Spirit • Unlike the Pyramids, the monuments of the spirit will not stand untended. They must be nourished in each generation by the allegiance of believing men and women. The fact that millions have died violent deaths while defending individual freedom does not ensure survival of that principle if we cease paying our tithes of devotion.

Every free man, in his work and in his family life, in his public behavior and in the secret places of his heart, should see himself as a builder and maintainer of the ideals of his society.

Individual Americans—truck drivers and editors, grocers and senators, beauty operators and ballplayers—can contribute to the greatness and strength of a free society, or they can help it to die. *Life Magazine. The National Purpose. John W. Gardner. Chicago Daily News June 25, 1959.*

New tool for dental prophylaxis

H. A. Zander, M.S., D.D.S.; Jacques T. Kohl,† M.D., D.D.S., and Howard Keller,‡ B.S., Rochester, N. Y.*

A new vibratory tool for dental prophylaxis derives its energy from a stream of air, and operates at a resonant frequency of about 7,000 vibrations per second. Interchangeable scaling tips can be attached to the vibrator with a locking nut. Use of the tool leaves a smooth tooth surface free of calculus. No stream of water is used, hence no suction apparatus is necessary. The operator's sense of touch is not distorted. The absence of pressure makes scaling procedures more pleasant for the patient.

Different methods for performing a dental prophylaxis by means of mechanical equipment have been advanced during the past six years. One, the air-abrasive technic which makes use of dolomite powder and air, already largely has been discarded.[1] Use of ultrasonics in removing calculus and stains has been tried also. With this method a stream of water is directed over the various scaling tips of the ultrasonic instrument, and calculus and stain are removed with ease. It is not entirely clear whether the cavitation of the water or the vibration of the tip on the tooth is responsible for dislodging the calculus with this instrument.[2] Another method which makes use of a vibratory tool has been described by Karlström.[3] A different method makes use of tapered contra-angle burs which have six facets; these burs when used in a high-speed contra-angle handpiece are said to produce vibrations of 12,000 cycles per second.[4] These vibrations also dislodge calculus speedily. The purpose of this paper is to report on still another vibratory tool for the removal of both calculus and stain.

This instrument derives its energy from a stream of air. It consists essentially of a driving element, "a," and a vibrator, "b" (Fig. 1, above). An enlargement of the driving element, or generator, is shown in Figure 1, right; the rotor has an inside diameter which is greater than the diameter of the pin that holds it. When the rotor is caused to revolve by a stream of air, it rides around the pin, thereby setting up a vibration in the vibrator (Fig. 1, above). The jet velocity of the air is dependent on the pressure of the air supplied, and this air velocity determines the speed of revolution of the rotor which in turn governs the frequency of vibration. It is important that the instrument is operated at its resonant frequency, approximately 7,000 vibrations per second. To attain this frequency, about 30 pounds of air pressure per square inch is necessary. The rotor is lubricated by the same device used in the

common air turbine drills, through provision of sufficient oil mist in the air stream.

Various interchangeable scaling tips can be attached to the vibrator by means of a locking nut. Since these tips are similar in shape to those used in hand instruments, either hand pressure or the air power may be employed in their actual usage. The motion of the scaling tips powered by air duplicates, by and large, that used with hand instrumentation.

The sickle-shaped tip moves in a plane which is parallel to the curvature of the tip. In this plane the excursion of the tip is about 0.25 mm. (Figure 2 shows the moving tip.) This tip should be applied to the tooth surface in such a way that the angle between the blade of the sickle and the tooth surface to be scaled is approximately 80 degrees. Because the energy which is normally supplied by hand with few strokes is provided by the cutting edge moving 7,000 times per second with a stroke of 0.25 mm., almost no pressure is necessary for the removal of calculus and stain. It is important that this sickle tip is not held in one position for any great length of time but kept moving over the tooth surface to allow even energy distribution.

When a file tip is inserted, the motion is perpendicular to the teeth of the file. The speed and distance of movement of the file tip is about the same as that of the sickle. The files are angulated in such a way that they can reach every tooth surface.

If the teeth of the file are removed, there remains a point or tip which looks like a plane or chisel. This tip can be used to remove calculus in much the same way as a hand chisel. The tip's vibratory motion which is in the same plane as its ground surface (face) is responsible for the calculus removal. Therefore, again, no pressure should be used with this tip.

The fourth type of tip is known as a curet. The principle of using the curet is similar to that of the sickle in that the face of the blade should be held at about a 75 to 80 degree angle to the tooth surface.

These tips should be sharpened the same way as hand instruments.

This instrument has been used by the senior author (H. A. Z.) and his hygienist in performing over 100 dental prophylaxis operations on patients of all ages, and has been found to be efficient in removal of both calculus and stain. It has been found also to be useful in planing and smoothing of crown and root surfaces. Because of the light brushing motion used, the danger of gouging the surface is greatly minimized. The tooth surface scaled appears to be smooth.

In order to test our clinical impressions, 18 teeth heavily covered with stain and calculus were scaled, nine teeth by vibratory tips and the others by the corresponding hand instrument. The teeth were then extracted and compared for surface finish and residual calculus and stain. No difference could be observed either with the naked eye or when the comparison was carried out under a binocular microscope at 25X magnification. At this magnification one can clearly distinguish cracks, lamellae, scratches and other surface irregularities besides calculus deposits. Both the hand instruments and the vibratory tips left a smooth, calculus-free tooth surface. Occasional fine scratches could be observed on teeth in both groups.

The advantages of this instrument over previous mechanical prophylaxis instruments are:

No stream of water is used. Therefore, no suction apparatus is necessary during the operation, and the operator's visibility is not impaired. The amount of frictional heat produced is very little because of the direction of the vibrating stroke. Obviously, if the tip is held at the wrong angulation and direction, this does not hold true.

The sense of touch is not lost. By removal of the foot from the switch,

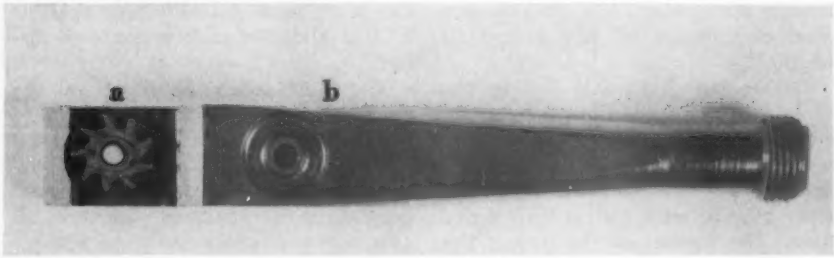

Fig. 1 • Above: Working parts of instrument. a, driving element or generator; b, vibrator. Right: Higher magnification of driving element showing eccentric position of rotor on its axis

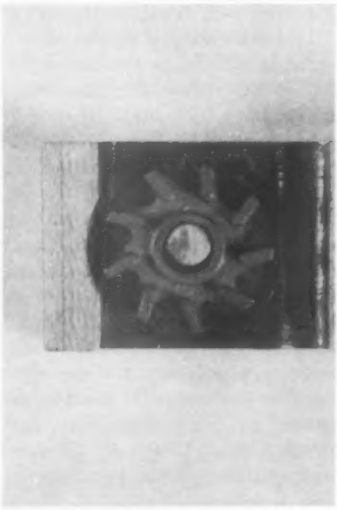

Fig. 2 • End of sickle-shaped tip in motion

complete sense of touch is restored. The operator's hands will not tire, since this instrument operates by movement of the tip over the tooth surface and not by the application of pressure. The absence of pressure makes scaling procedures more pleasant for the patient. The instrument requires no routine maintenance.

Some may find a period of adjustment necessary since the power handle is of necessity somewhat larger than the handle of a hand instrument.

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Symposium on genetics related to dental health: a summary report

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Because of the growing interest in the relationship of genetic influences to oral disease, it was considered important to gather the existing but widely scattered information, and to make it readily available to teachers and investigators. Accordingly, on April 3-5, 1961, a symposium was held in Washington, D.C., sponsored by the American Dental Association and supported by a grant from the National Institute of Dental Research (Symposium Grant D-1132).

The conference was attended by 100 scientists from the United States and Canada, with three representatives from Denmark and Sweden. The participants were geneticists and dentists whose research and interests were in oral diseases with a genetic background. The program was under the direction of the Council on Dental Research and its consultants. Special credit should be given to Carl J. Witkop, Jr., head, section on human genetics, National Institute of Dental Research, for the design of the conference. Thomas J. Hill, Seymour J. Kreshover, Robert M. Stephan and William F. Swanson served as chairmen of various sections of the Symposium.

The conference opened with a review of the biochemical mechanisms which form the basis of heredity and of how these influences affect metabolism in the production of inherited disease. The subsequent discussions of specific diseases with a genetic background were arranged so that each topic was discussed by two participants, a geneticist and a dentist, with special qualifications in that field.

The conference covered methods for the study of genetic influences, the effects

of radiation and a number of specific diseases or conditions with a genetic background.

H. Bentley Glass, Ph.D., Baltimore, Maryland, in discussing the biochemical basis of human heredity considered the manner by which a molecule of desoxyribonucleic acid (DNA) of a gene transfers its chemical pattern to ribose nucleic acid (RNA) which moves from the nucleus to the cytoplasm and results in establishing the pattern for producing some specific enzyme or other protein molecule of the cell. The gene DNA thus governs specific metabolic steps, and any genetic interference by mutation may produce "inborn errors of metabolism."

James V. Neel, M.D., Ann Arbor, Michigan, considered the criteria necessary to determine that a disease has a genetic background and described some of the special problems of dental genetics.

Dr. Witkop discussed dental problems which have a genetic background. He outlined two general types of diseases: first, those which are easily distinguished and probably are traceable to a single gene substitution and, second, those which both have a genetic background and are also influenced by environmental factors. He further discussed his work with epithelial cell defects.

Bertram S. Kraus, Ph.D., Seattle, classified the kind of problems with which dental genetics is concerned. He emphasized the closely related fields of paleontology, anatomy, anthropology and other sciences and stressed the need for cross-fertilization between scientific disciplines in genetic research. He recited some of the approaches employed in the accumulating material relating to postnatal growth, development and morphology of the human dentition as related to hereditary control of normal variations.

Statistical design and experimental methods were discussed by William J. Schull, Ph.D., Ann Arbor, Michigan. In describing the collection, tabulation and analysis of data, Dr. Schull placed emphasis on the many variables that have to be dealt with in genetic research.

Richard H. Osborne, Ph.D., New York, reviewed the use of twins in genetic studies. He emphasized the necessity of good methods for determining zygosity and he illustrated fields where the researcher could use the study of twins to good advantage. Harold O. Goodman, Ph.D., Winston-Salem, North Carolina, drew attention to the conflicting results obtained from studies of dental caries in twins. He said that it was not possible to state whether the use of more refined methods of caries detection and scoring would be more effective in revealing significant differences between younger identical and fraternal twins.

Coenraad F. A. Moorrees, Boston, presented a discussion of dental anthropology. He said that the dentition does not serve as a sound criterion of race; no master pattern of dentition has been established for Negro and white as has been demonstrated for Mongols. Further investigations are needed, in carefully selected racial stocks, in which, by studying dental characteristics already classified racially, the modes of inheritance and gene frequencies of these characteristics may be determined.

James B. Wyngaarden, M.D., Durham, North Carolina, discussed inherited disorders of metabolism including the following classes: those which lead to susceptibility to disease because of inherited incapacity to deal with environmental factors, those which deal with metabolic transport functions rather than enzyme functions, and those which result from missing enzymes and from structural changes in proteins. Although there are recognized to be a large number of inborn errors of metabolism, in only about 20 conditions has the missing enzyme or abnormal protein been identified.

Inherited changes in tooth form recognized through anthropological studies of the historical and evolutionary drifts of population were described by Albert A.

Dahlberg, Chicago. He presented some of the problems that confront the anthropologist in such studies.

John T. Gentry, M.D., Albany, New York, discussed heritable disturbances or abnormalities of organogenesis. He illustrated the importance of environmental factors by recalling the use of drugs to produce teratogenic changes in laboratory animals, and the geographic incidence of certain diseases. F. Clarke Fraser, M.D., Montreal, Quebec, Canada, continued the discussion as applied to the experimental development of cleft palate and other abnormalities in animals.

Frederick D. Malkinson, M.D., Chicago, and George W. Greene, Jr., Washington, D.C., discussed heredity in relation to genodermatoses or ectodermal dysplasias. Diseases or syndromes in this group are the result of abnormalities in the development of the epidermis and its appendages. The entities selected for discussion were from a large group of diseases in this class that are of interest to geneticists and dentists.

The influence of heredity on dental caries, and on the occurrence of congenitally missing teeth, was reviewed by Hans Grahnen, Malmo, Sweden. He said that although evidence suggests that genetic factors participate in the regulation of susceptibility to dental caries, from a practical point of view the environmental factors predominate. H. R. Hunt, Ph.D., East Lansing, Michigan, discussed the inheritance factor in dental caries susceptibility in rats. He agreed with Dr. Grahnen that, as a public health measure, inherited resistance may at present be of little significance in the control of dental caries. But, he stated, his work has developed a strain of rats that are genetically resistant to caries, and he expressed the thought that work with such strains might lead to valuable information in the control of dental caries in humans.

A detailed presentation on the hereditary anomalies of the enamel and dentin was made by Sidney B. Finn, Birmingham, Alabama. He divided these abnormalities into two groups: those which affect the development and calcification of the enamel and dentin (amelogenesis imperfecta) and those related to metabolic blood disorders. He said that although dentinogenesis imperfecta, which he fully described, has been considered as a defect of the mesodermal tissues, it may also involve the ectodermal structures to some degree. Einar Hals, Aarhus, Denmark, continued the discussion of enamel defects with a well illustrated paper on the histological observation of these abnormalities.

Harry Sicher, M.D., Chicago, and Harold F. Falls, M.D., Ann Arbor, Michigan, jointly discussed a large group of bone abnormalities of genetic origin. A plea was made for all examiners and practitioners to become more familiar with these syndromes, and for a greater awareness of genetic considerations on the part of those who render diagnostic services.

Prof. P. O. Pedersen, Copenhagen, Denmark, and Roscoe D. Hughes, Ph.D., Richmond, Virginia, provoked much interest in the need for teaching genetics as a basic science preliminary to the understanding of disease. They noted that only three dental schools in the United States have courses in genetics and in only one school is it a required course. There was a strong sentiment among participants of the Symposium for placing more emphasis on the teaching of genetics as an integral part of the dental curriculum.

The conferees adopted the following statement, introduced by Dr. Dahlberg:

At this conference of dental educators, research workers, geneticists, practitioners, scientists and other interested persons, the importance and value of the science of genetics to dentistry were made apparent. It has also been demonstrated that a clear comprehension of dental biology has been facilitated through programs of education and research in genetics in several dental schools and institutions.

The participants in the Symposium on Genetics Related to Dental Health agree that it is highly desirable to include basic genetic studies in the curricula and programs of dental schools by means of formal courses in genetics either in the academic program or as a requisite in the preprofessional preparation of the students.

The participants urge that the importance of genetic knowlege in making clinical judgments and evaluating research reports be called to the attention of dental faculties and the profession.

The participants expressed thanks and appreciation to the American Dental Association and the National Institute of Dental Research, to Thomas J. Hill, J. Roy Blayney, Seymour J. Kreshover, Sholom Pearlman and Carl J. Witkop, Jr., "for their foresight in sponsoring this conference which has served to crystallize many ideas relating to genetics and dental health." As one participant put it: "The gathering here of scholars of diverse fields of interest reflects not only the traditionally broad basis from which significant contributions to dental genetics have been made but also the growing need for understanding communications. It is desirable that there be some unifying agency or society so that important advances made on many fronts may be coordinated into a coherent story of the dentition."

It is planned to collate and publish the manuscripts and proceedings of the Symposium in the near future. This publication should serve as a useful basis for further research and educational activity on the genetic aspects of oral health and disease. *Riverview Rd., Rt. 82.*

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†Secretary, Council on Dental Research.

Ready-Made Mixtures of Antibiotics • It is discouraging and disquieting that, in spite of repeated expositions of the defects of the fixed combinations and the potential or actual dangers of their application, they are still being prescribed in sufficient quantity, both here and abroad, to encourage the manufacturers in continuing their production and in promoting their use. It cannot be too strongly emphasized that the best interest of the individual patient is served and the least harm done when antibiotics are prescribed, each in its optimum dosage and only for infections in which it is specifically indicated. Their possible curative and life-saving properties will also best be preserved for other patients if they are always used only in this manner. ***Antibiotics in Fixed Combination, Editorial, New England Journal of Medicine, February 4, 1960.***

Dermatitis involving the dentist's hands

Kenneth H. Burdick, M.D., Cleveland

Many dentists are plagued unnecessarily by dermatitis, with resultant discomfort, embarrassment and loss of income. The dentist should maintain the structural integrity of the skin of his hands by avoiding excessive use of soaps and irritants, and by keeping the skin oiled. A good hand cream should be used at least three or four times a day, and oftener in winter. The dentist should avoid irritation of the skin and careless use of potential allergens.

Dentists continually subject their hands to physical abuse, to contact with many potent allergens, and to exposure to infectious agents. The dentist's economic dependence on his hands is self-evident, and many dentists have been plagued unnecessarily by unsightly dermatitis, with resultant discomfort, embarrassment, and loss of income. Many times, the dermatitis could have been prevented or its course shortened, had certain simple, basic factors been kept in mind, and had each skin irritation been treated as potentially dangerous. Often, the dentist, in the treatment of a rather minor skin condition, has made himself allergic to drugs that he must use every day in his work, whereas an understanding of the allergic potential and of cross reactivity among these various medications would have prevented sensitization from occurring.

CONTACT DERMATITIS

By far the most important group of dermatoses, to the dentist, are the inflammations of the skin caused by direct contact with allergens and chemical irritants. Careful differentiation between the primary irritation and the true allergic dermatitis is most important both to the dentist and to the physician caring for him. This differentiation may be based on the history, the appearance of the eruption and its distribution.

Primary Irritant Dermatitis • Primary irritant dermatitis is irritation of the skin by substances contacted topically, such as soaps, acids and caustics. The skin's natural structural resistance to irritation and infection is altered, the normal oils of the skin are removed, the pH of the skin is changed by contact with acid or alkaline materials, and the horny layer is damaged by materials of high detergency and desiccating activity. When the number of times the average dentist applies soap and water to his hands is considered, it seems almost miraculous that the skin is able to withstand this unnatural routine as well as it does. Considering, in addition, the organic solvents, plasticizers, waxes, calcium hydroxide, alcohol and the host of other chemical substances used in their work, how surprising it is that more dentists do not impair the use of their hands.

Prevention of primary irritant contact

dermatitis is rather simple. The dentist should use cleansing agents on his hands as infrequently as possible. These agents should be carefully selected, preferably neutral or slightly acid, and with or without hexachlorophene as the bacterial controlling agent. Often it would be quite permissible for the dentist merely to rinse his hands, as this is highly effective in removing bacteria and soil. Soft towels of the finest quality should be used; drying should be by patting, rather than by vigorous rubbing.

Oiling of the hands should be carried out as frequently as is consistent with the ability to hold instruments securely. Although most unperfumed hand creams are satisfactory, if used regularly, hand cream with the following formula has been accepted well by some dentists: glycerin 10 per cent, lactic acid 3 per cent in a sufficient quantity of water-washable ointment base. A good hand cream should be used a minimum of three or four times a day, and oftener during the cold winter months, when chapping of the hands is common. During cold weather, warm gloves should be worn.

Even about his home the dentist must be aware of the hazards of contact with irritant and sensitizing chemicals used in gardening, hobbies and repair work.

Allergic Contact Dermatitis • Primary irritant dermatitis disappears with rest and avoidance of the traumatizing agents. However, when the dentist becomes allergic to the materials that he uses every day in his work, there is often no "cure" other than complete avoidance of these allergens. This may prove to be impossible to the practicing dentist. An understanding of the factors leading to the development of allergic dermatitis, and its prevention, therefore is of the utmost importance.

An allergen need not be something new, or something that has been introduced recently into the office of the dentist. The development of sensitization may require many years of constant exposure. The exact conditions under which the patient becomes allergic are not known. Any potential allergen that has the capacity to irritate the skin primarily can produce allergic sensitization more readily, but sensitization may be produced or continued by allergens in amounts so small as to be hardly measurable and in concentrations insufficient to irritate the nonallergic skin.

A dentist has daily intimate contact with a number of chemicals that have great potential sensitizing ability: for example, local anesthetics, x-ray processing chemicals, antiseptics, salts of heavy metals, as well as simple organic compounds such as phenol. His hands, macerated by contact with oral secretions and constant washing with soap and water, are often irritated and chapped, and the normal protective barriers of the skin are impaired, allowing free penetration of potential allergens. Experiments with animals have shown that irritation of the skin by such means increases the frequency of induced sensitivity.

Cross reactivity of allergens is a concept that is important for the dentist to understand, both for his own sake and for the sake of his allergic patients. A person who has become allergic by contact with one substance may react to a number of other chemicals of closely related molecular configuration. The term "sensitizer" is applied to the antigen producing the reaction primarily; "elicitors" are those drugs or chemicals with chemical structures so similar to the structure of the antigen to which the patient has been primarily sensitized that contact with them causes an allergic reaction. This structural relationship may be simple or intricate. For example, a person sensitized to mercury by mercury bichloride will usually react to any inorganic or organic compound containing mercury bound to it in such a way that the mercury ion will dissociate within the skin to form a complex with the proteins

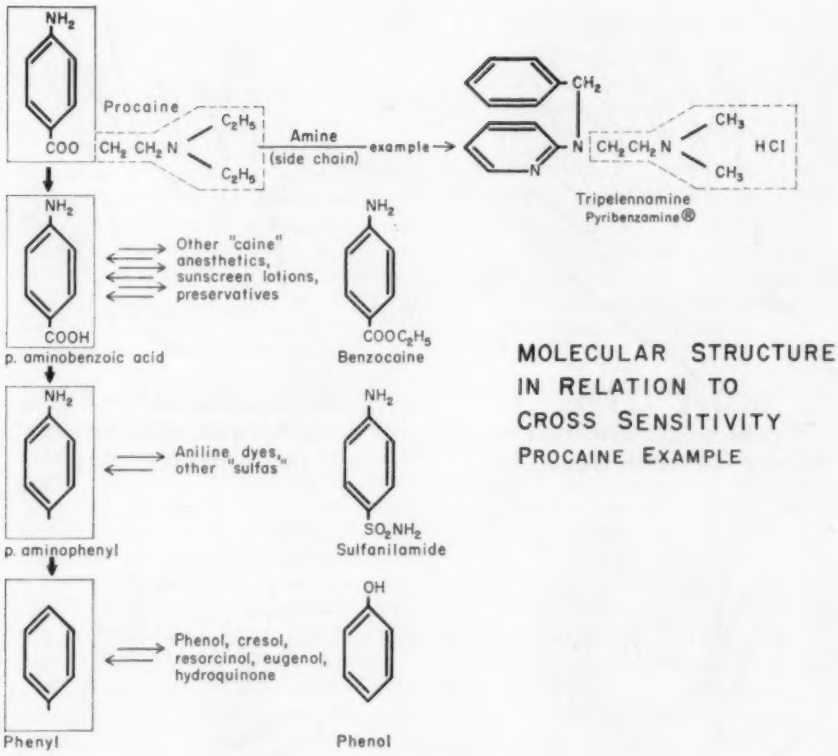


Figure 1

of the body. It is this mercury-protein (haptene) complex to which the body reacts, not the mercury per se.

A more complicated example is the reaction to procaine. This reaction involves the molecule's acting by itself as an antigen, without the necessity to combine with protein, and may be specific for procaine alone. On the other hand, the procaine also may have induced sensitivity to other chemical complexes, depending on what portion of the molecule has caused the sensitization (Fig. 1).

Allergic contact dermatitis has several points that differentiate it from the systemic allergic reactions of the type causing hay fever, asthma, anaphylactoid reactions and certain drug reactions, in that by the usual complement fixation, agglutination and precipitation tests there are no measurable circulating antibodies in the blood stream, and conventional skin tests by the scratch and intradermal methods are unrevealing. The antibodies for this eczematous reaction apparently are dependent on the presence of the intact lymphocytes in the skin.

To determine the specific antigen involved, the dermatologist must resort to the classic patch test. The suspected antigen is applied to the skin, usually for 48 hours. A positive reaction will range from an area of mild redness to a large, scarlet, blistered reaction of the skin under the antigen.

There are several important considera-

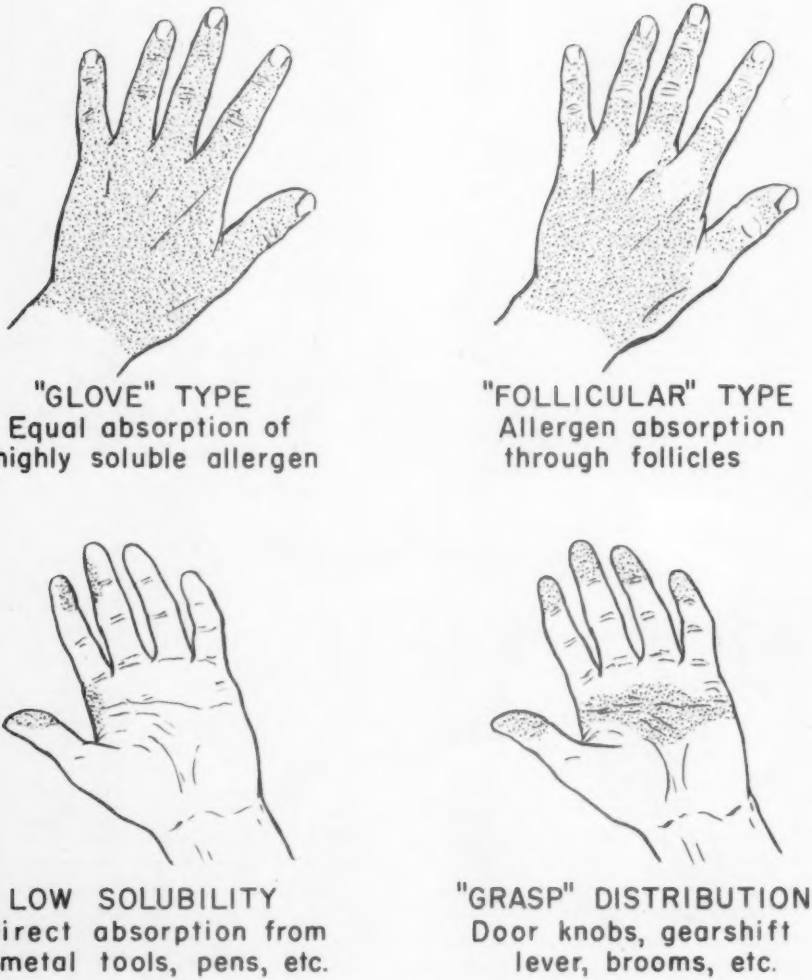


Fig. 2 • Common distribution of allergic hand eruptions

tions in patch testing, and it should be carried out only by an expert. False positives may occur when the substances tested are applied in concentrations irritating to the skin. Positive test reactions must be correlated with the possibilities of exposure and with the clinical course of the eruption. This type of testing should not be carried out while the dermatitis is in the acute stage, as the absorption of even minute amounts of antigens into the blood stream may cause a remarkable increase in the severity of the dermatitis. In addition, there always is some slight but definite possibility of actually causing allergic sensitization, and this hazard may be increased by improper patch testing. Knowledge of the possible cross re-

actions will help in avoiding the antigen and its chemical "relatives." An excellent discussion by Baer of cross sensitivities may be found in *Modern Trends in Dermatology*.[1]

The distribution or the exact site of the dermatitis often will aid in the detective work necessary to determine the source of the antigen involved in contact dermatitis. For example, antigens in solution penetrate better through the hair follicles and fat glands than through the sweat glands. The palmar surface of the hand contains only sweat glands; therefore, antigens in solution usually cause a much more severe reaction on the backs of the hands and fingers. Poorly soluble antigens usually react at the site of the closest, prolonged exposure; for example, the dermatitis of the tips of the first three digits and the web between the thumb and forefinger seen in metal sensitivity corresponds to the areas used to hold a drill or probe (Fig. 2). An excellently illustrated text, *Contact Dermatitis*,[2] is recommended for further understanding of this problem.

All possible antigens and irritants must be avoided completely and the raw, weeping surface treated conservatively with lotions or compresses. In an extremely severe reaction, a short course of hydrocortisone administered orally may be helpful. When the acute eruption has subsided, careful determination of the sensitizer must be carried out and a program of avoidance of the sensitizers and possible cross reactors must be instituted.

Many times the dentist exposes himself to the possibility of sensitization unwittingly, and the indiscriminate use of the following materials should be avoided at all times:

1. Mercurial antiseptics
2. Ointments or lotions containing
   a. Antihistamines
   b. Sulfonamides
   c. Penicillin
   d. Antipruritics of the "caine" group
3. Solutions containing
   a. Chromium salts
   b. Nickel salts
   c. Formaldehyde
   d. "Raw" plasticizers
4. Defatting and desiccating agents (for example, plaster, soap and organic solvents)

The dentist will do well to keep in mind at all times, both at work and during leisure hours, the possibilities of contact with these antigens.

INFECTIOUS DERMATOSES

The common infections of the dentist's hands may be divided into the following categories: acute cellulitis, the chronic, infectious eczematoid "process," yeast infections and fungous infections.

Acute Cellulitis • Considering the exposure of the dentist's hands to microorganisms, acute cellulitis is uncommon. The cardinal signs are localized redness, swelling, tenderness and lymphatic "red streaks" spreading up the arms; the lymph nodes become swollen and tender, and fever and general malaise may occur. The treatment should be prompt, and should consist of rest of the hand and appropriate antibiotics. If possible, a culture should be taken before therapy is started, allowing definite identification of the infecting organism and determination of the most effective antibiotic.

Infectious Eczematoid Dermatitis • A chronic, recurrent eruption on the hand, infectious eczematoid dermatitis manifests itself as an allergic response to a low-grade infection, many times with organisms normally "resident" on the skin. It usually starts around a cut or fissure. The body, in an attempt to enhance its natural immune processes to rid itself of these organisms, becomes hypersensitive and reacts to the microbe as it would to any other allergen. The result is a red, vesicu-

3

4A

4B

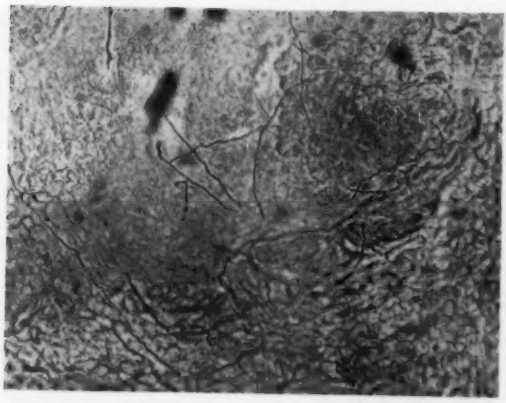
Fig. 3 • Infectious eczematoid dermatitis

Fig. 4 • Yeast infections of the hand. A, paronychia. B, infection in the web spaces (eroseo interdigitalis blastomycetica)

Fig. 5 • Fungi seen in microscopic examination of scales from patient

Fig. 6 • Typical fungous infections of hand. A, nails and thumb. B, nails, dorsum of right hand and left palm

Fig. 7 • Roentgen-ray dermatitis showing atrophy, ulceration and malignant degeneration



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6A

6B

7

lar eruption, with oozing, scaling and crusting surrounding the site of the actual infection. This reaction does not rid the skin of its invader, and the inflamed skin and the serous exudate provide an excellent milieu for further bacterial growth (Fig. 3).

Treatment should consist of rest of the infected part, careful identification of the bacteria involved, with in vitro measurement of their sensitivity spectrum, and the use of antibiotics, both systemically and locally, as appropriate. Local therapy in addition to systemic antibiotics is important; the form of such therapy depends on the stage of the eruption. While it is acute, compresses or soaks may be of benefit; in the chronic stages, the use of coal-tar preparations to help build new skin may be helpful. The addition of hydrocortisone or its derivatives locally may aid materially in shortening the treatment and give symptomatic relief. The use of hydrocortisone locally alone should be avoided, as it may mask the infection —giving temporary relief but actually contributing to extension of the infection.

A number of variants of the infectious eczematoid process have been described in the literature, and the names of "acrodermatitis continua," "dermatitis repens," and "dermatitis perstans" have been applied to eruptions of similar nature.

Yeast Infections (Moniliasis) • Yeast infections of the hands are most common in those people whose hands are frequently immersed in soapy water or other macerating agents; these conditions, and frequent exposure to yeast in the mouths of patients, cause repeated infections on the dentist's hands.

Two distinct types of yeast infection are seen: one associated with the bed of the nail, and one in the webs of the fingers. In the first type, the tissues surrounding the fingernail usually become sore and bright red, forming a paronychial abscess which usually must be drained. The bed of the nail itself may become involved, secondary to the paronychia, and chronic infection causes disfigurement and distortion of the nail. The nail may act as a reservoir for repeated yeast infections of the surrounding nail folds (Fig. 4, A).

The second form occurs in the warm, moist spaces between the fingers, particularly between the third and fourth digits, which lie in closest apposition. This condition has the unwieldy name of "erosio interdigitalis blastomycetica." The web between the fingers is usually red, moist and fissured, whereas on the dorsum of the hand an erythematous dermatitis may be present, with small pustules and scales in the advancing border. The yeast can be seen on direct microscopic examination of the pus or scales in most instances, and can be cultured on Sabouraud's medium. Specific treatment with a lotion or an ointment containing nystatin, with or without hydrocortisone, will usually clear this eruption promptly, but meticulous care of the hands is imperative to prevent recurrences (Fig. 4, B).

Fungous Infections • Fungous infections of the hands are also of two distinctly different types. The most common of these is the "id" reaction, which is not an infection of the hands, but is an allergic manifestation due to a remote infection, usually athlete's foot. Obviously, all attempts to isolate fungi from the eruption on the hands by direct microscopic examination or by culture will be fruitless. Typically, during the first warm spring days, itching of the feet with a few grouped vesicles over the instep, on the heel, or between the toes, is noticed. If examined under the microscope, the roof of these vesicles will show many fungi (Fig. 5). Accompanying this activation of the fungous infection, a few scaly flecks may be seen between the fingers or on the palms of the hands. If the sensitivity of the patient to the fungus is severe, small pruritic vesicles appear on the sides of the fingers. These may rupture

8A

8B

Fig. 8 • Psoriasis of the nails. A, "pitting" changes. B, subangual psoriasis—note zone of erythema at edge of nail

9

Fig. 9 • Localized neurodermatitis of the palm—the result of prolonged scratching

or be scratched open or they may grow to be large, tense blisters and pustules which may involve a considerable portion of the surface of the hands.

Of prime importance is the prevention of reactivation of the athlete's foot by the prophylactic use of appropriate antifungal agents, by careful rotation of shoes and by keeping the feet as dry as possible. Fortunately, if prophylactic treatment fails, most of the common athlete's foot type of infections can now be treated successfully by the use of the new oral fungistatic, griseofulvin. In adequate doses it will control the acute infection, and if taken over a sufficient period, may eliminate the chronic infection. However, since the adult American man is highly susceptible to infection with fungi, the reinfection rate may be high. Obviously, the "id" eruptions on the hands will respond best to adequate treatment of the focus of infection, but the raw, open skin should be protected carefully to prevent secondary infection or allergic sensitization to topical chemicals.

Fortunately, true fungous infection of the hand is rare, as it has been a difficult condition to cure. This eruption is usually unilateral, commonly affecting the hand

that is most used. It appears as a dry, faintly erythematous, scaly, confluent eruption, usually without much vesiculation, and it may be so faint as to be scarcely noticeable at the first glance. Commonly, one or more fingernails are also involved. Growth of the nail is disturbed, and keratotic material accumulates near the distal edge of the nail plate (Fig. 6).

This type of infection may be difficult to differentiate from psoriasis or yeast infections of the hand; expert clinical observation and mycologic investigation are required. Griseofulvin is highly specific, but unfortunately, it is not effective against yeast and bacteria, and will not affect psoriasis, so it should be used only after the diagnosis is definitely established. Therefore, in all instances of infection, the establishment of the exact etiologic agent is of the utmost importance, particularly if the practitioner is to apply correct, effective therapy. Ill-advised self-medication may obscure the diagnosis and compound the difficulty of definitive therapy.

MISCELLANEOUS DERMATOSES

Roentgen-ray Dermatitis • Inflammation of the skin caused by roentgen rays is fortunately much less common since the advent of better protection and of education concerning the hazards of the use of roentgen rays. The atrophy, telangiectasia, ulcers and malignancies associated with these degenerative changes should be so familiar that elaboration is redundant (Fig. 7).

Psoriasis • Psoriasis occasionally is seen on the hands and involving the fingernails as mentioned. It may appear so strikingly similar to fungous infections of the hands and nails that only an experienced dermatologist can differentiate these conditions (Fig. 8).

Neurodermatitis • The most common diagnosis made on referred patients is neurodermatitis. The diagnosis usually has been erroneous, because of insufficient knowledge or failure to detect the source of the dermatitis. Actually, only two entities can be classified correctly as neurodermatitis: the generalized neurodermatitis (atopic dermatitis), and the localized neurodermatitis (lichen simplex chronicus). Atopic dermatitis usually is associated with a long history of "eczema," "dry skin," and asthma or hay fever. The sites of predilection are the flexural folds, the face and the neck. The family tree of the patient with atopic dermatitis is apt to show many allergic individuals. Although psychic factors are important, this disease must be treated by careful attention to the patient's systemic allergies.

Localized neurodermatitis is the result of continual scratching or irritation of the skin, and shows sharply demarcated, thick, pink, dry plaques, which itch paroxysmally. Usually, only one or two such plaques are present at any time, and they are always in areas that are readily accessible to the patient. Psychic tensions are expressed by continual scratching (Fig. 9). These lesions may be cured by occlusive dressings or by breaking the patient's scratching habit.

SUMMARY

The structural integrity of the skin must be maintained by avoiding excessive use of soaps and irritants and by keeping the skin oiled. Irritation of the skin and careless use of potential allergens should be avoided. *2020 E. Ninety-third Street*

From the department of dermatology, The Cleveland Clinic Foundation and The Frank E. Bunts Educational Institute.

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Dental caries among Hawaii's school children

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James R. Robinson,† D.D.S., Jefferson City, Mo., and
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A dental caries survey of 96,000 Hawaiian school children revealed that the caries attack rate on the permanent teeth of these children is one of the highest in the nation. At age 16, only about 1 out of 100 children had caries-free permanent teeth. The percentage of erupted permanent teeth having decay varied from 7.6 per cent at age 5 years to 47.7 per cent at age 16. The average number of decayed teeth per person at 16 years was 13.36. Children of Japanese extraction have the highest caries attack rate and Caucasians the lowest. Tooth decay is the most prevalent chronic disease affecting the people of Hawaii.

This report gives results of a dental caries survey conducted in all counties of the state from December 1957 through March 1959 among children attending public and Catholic schools. Dental hygienists of the Department of Public Instruction made dental inspections using technics and a record form recommended by the U. S. Public Health Service. J. R. Robinson, then director, Division of Dental Health, Hawaii State Department of Health, and a joint author of this report, initiated the survey, conducted a workshop with the dental hygienists, and gave general direction to the greater part of field work. Mrs. Evelyn Kikuta of the Department of Public Instruction supervised the field staff. Statistical work was done in the Office of Health Statistics, State Department of Health, in collaboration with the Division of Dental Health.

The survey included 90,000 children 5 to 16 years of age in the public schools and 6,000 of the same age in Catholic schools. The number in the public schools constituted about 73 per cent of total enrollment 5 to 16 years of age; the number in the Catholic schools was about 33 per cent of enrollment at the specified ages.

Inspections did not follow a systematic random sampling plan. Nevertheless, since inspections were made in nearly all schools and included a high percentage of total enrollment within the age brackets specified, the sample from the public schools was probably representative. The representativeness of the sample from the Catholic schools was more open to question; however, inspections were made in 18 schools located in all counties and constituting more than 50 per cent of all Catholic primary and secondary schools.

Statistical tabulations were made from a sample consisting of every other inspection record. Thus, 45,551 records for public school children and 3,012 Catholic

Table 1 • Number of DMF permanent teeth per 100 erupted teeth among children 5–16 years of age attending the public schools, State of Hawaii, 1958

Age at last birthday	Number of children in sample	Number of permanent teeth erupted [a]	Decayed (D) teeth[b]		Missing (M) teeth[c]		Filled (F) teeth		DMF teeth[d]	
			Number	Rate [e]	Number	Rate [e]	Number	Rate [e]	Number	Rate [e]
5	4,090	5,813	327	5.6	—	—	117	2.0	444	7.6
6	5,044	27,762	2,065	7.4	53	.2	1,498	5.4	3,616	13.0
7	5,155	50,126	3,950	7.9	121	.2	5,155	10.3	9,226	18.4
8	5,301	68,437	5,413	7.9	389	.6	8,933	13.0	14,735	21.5
9	5,212	84,937	6,713	7.9	554	.7	12,261	14.4	19,528	23.0
10	5,295	107,570	8,924	8.3	990	.9	17,217	16.0	27,131	25.2
11	4,455	106,004	9,159	8.7	1,316	1.2	18,374	17.3	28,849	27.2
12	2,582	67,785	7,186	10.6	1,133	1.7	13,514	19.9	21,833	32.2
13	2,858	78,285	8,863	11.3	1,739	2.2	18,828	24.1	29,430	37.6
14	2,037	56,503	6,938	12.3	1,497	2.6	14,702	26.0	23,137	40.9
15	2,244	62,476	6,408	10.3	2,189	3.5	19,757	31.6	28,354	45.4
16	1,278	35,782	4,237	11.8	1,854	5.2	10,984	30.7	17,075	47.7

[a] Erupted teeth: The number of permanent teeth present at time of inspection plus missing (M) permanent teeth.
[b] Decayed (D) teeth: Decayed and unfilled permanent teeth. A tooth both decayed and filled was counted as decayed (d).
[c] Missing (M) teeth: Missing permanent teeth because of caries and those which should be extracted because of caries.
[d] DMF teeth: This is the sum of decayed (D), missing (M), or filled (F).
[e] Rate: The number of teeth per 100 erupted teeth, i.e., the percentage of erupted teeth decayed (D), missing (M), or filled (F).

school children were used in statistical work. Where presented, data for the Catholic schools are shown separately. A grant from the National Institute of Dental Research of the Public Health Service was used to defray the cost of machine processing the data.

The standard measure, DMF teeth was used throughout the study.

The "DMF rate," as generally computed, is the average number of decayed, missing, and filled permanent teeth per child at a given age. It is obtained by dividing the total number of DMF teeth by the number of children inspected. A second DMF rate frequently employed is the number of DMF teeth per 100 erupted permanent teeth — in other words, the percentage of erupted teeth that are decayed, missing, or filled. Both types of rates are used in this report.

CARIES PREVALENCE

Table 1 illustrates that dental caries constitutes a serious public health problem in Hawaii; that it starts early in life and is progressive, causing tooth mortality unless treated by a dentist. Tooth decay is unquestionably the most prevalent chronic disease affecting the people of Hawaii.

At age five, when relatively few permanent teeth have erupted, the children involved in this study already had 7.6 per cent of their permanent teeth attacked by caries; at age 16, they had 47.7 per cent or nearly half of their erupted permanent teeth affected by caries.

Table 2 and Figure 1 show the problem in another way. Five year olds averaged per child about one tenth of a permanent tooth attacked by caries; by age 16, this average per child had increased progressively to 13.36 carious permanent teeth. This means that the permanent teeth of children in the age group aged 5 to 16 years on the average are attacked by caries at the rate of approximately 1.2 additional teeth per year.

Another measure of caries prevalence is the percentage of children with carious teeth, including all those having at least one affected tooth. This percentage rose

Table 2 • Number of DMF permanent teeth per person among children 5–16 years of age attending the public schools, State of Hawaii, 1958

Age at last birthday	Number of children in sample	Decayed teeth (D)	Missing teeth (M)	Filled teeth (F)	DMF teeth
5	4,090	.08	—	.03	.11
6	5,044	.41	.01	.30	.72
7	5,155	.77	.02	1.00	1.79
8	5,301	1.02	.07	1.69	2.78
9	5,212	1.29	.11	2.35	3.75
10	5,295	1.68	.19	3.25	5.12
11	4,455	2.06	.30	4.12	6.48
12	2,582	2.78	.44	5.23	8.45
13	2,858	3.10	.61	6.59	10.30
14	2,037	3.40	.74	7.22	11.36
15	2,244	2.86	.98	8.80	12.64
16	1,278	3.32	1.45	8.59	13.36

from 26.4 at age 5 to 98.8 at age 16. Thus, little more than one child out of a hundred at 16 years had caries-free teeth. (Table 8 shows the percentage of children with carious teeth from 6 to 14 years.)

The percentage of persons having one or more carious teeth and the average number of carious teeth per person, or DMF rate, are closely associated—that is, if the percentage having one or more carious teeth is high, the DMF rate tends to be high. Since this percentage can be obtained by a more cursory dental inspection, it is sometimes used to estimate the DMF rate.[1]

Of the 223,358 DMF permanent teeth among all children 5 to 16 years of age in the study sample, 31.4 per cent were decayed, 63.3 per cent were filled and 5.3 per cent missing. This may be termed the percentage composition of DMF teeth (Fig. 1).

The percentage filled is frequently referred to as the "F ratio"—that is, the ratio of filled teeth to the total decayed, missing, and filled. It is a measure of how well dental needs due to caries are being met. As will be discussed further along, this ratio in the present study was found quite high.

Table 1 shows the DMF composition as percentages of all permanent teeth erupted. In this case, taking the group 5 to 16 as a whole, 9.3 per cent were decayed, 18.8 per cent were filled and 1.6 per cent missing.

HAWAII COMPARED WITH MAINLAND AREAS

As yet, no reliable data exist showing the average decay rate for the country as a whole. Although a multitude of dental surveys among children have been made, results frequently remain unpublished and procedures often differ widely in making them. Moreover, to gain a more comprehensive picture of the prevalence of dental caries in Hawaii, comparisons should be made only with areas not having fluoridated water. After the drinking water of an area has been fluoridated over a period of a few years, a considerable reduction in the prevalence of caries among children occurs.

Table 3 shows nonfluoride areas of the country which could be found in available literature having complete data for children 6 to 14 derived from surveys comparable to the Hawaii survey. Data for the 11 comparable areas were completed from dental inspections of about 130,000 children. It is uncertain whether this is a representative sample of all children in nonfluoride areas. Nevertheless,

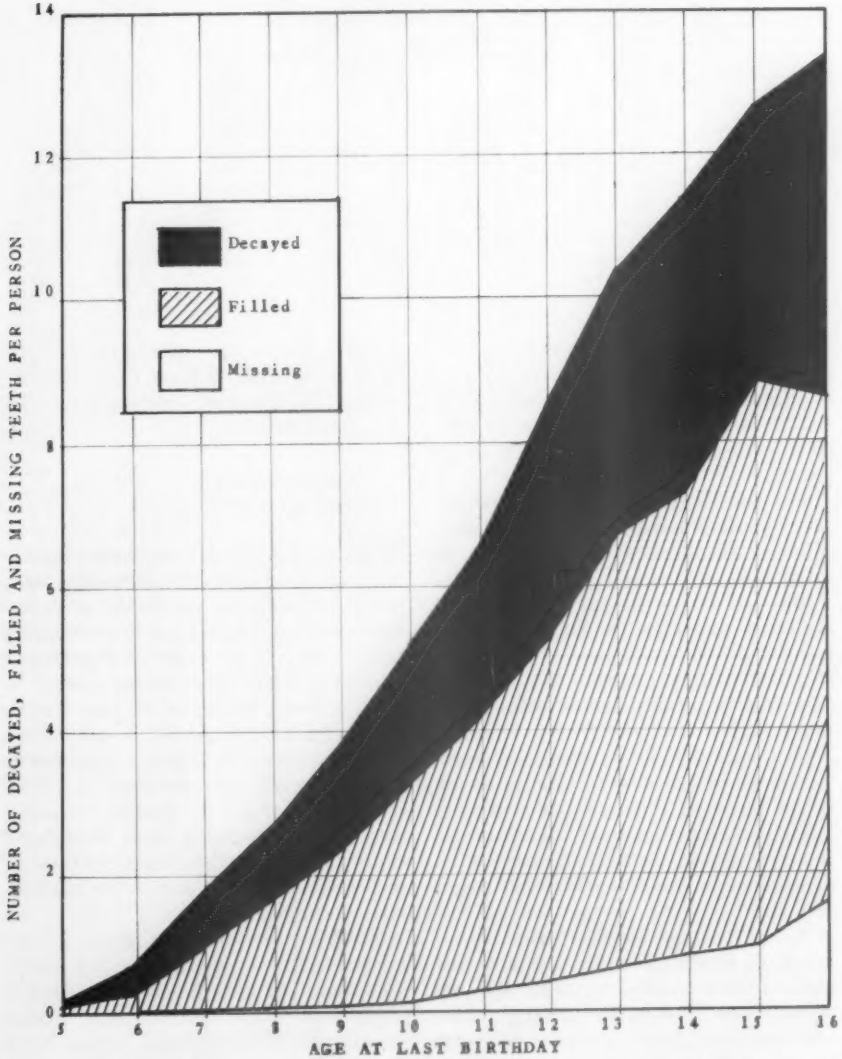

Fig. 1 • Caries prevalence in permanent teeth among children attending the public schools, State of Hawaii, 1958

it is probably the best comparative data available and serve to clarify the position of Hawaii with regard to the condition of children's teeth.

It should be noted that some of the areas shown in Table 3 have more recently fluoridated their water supplies. Consequently more current data on carious teeth from those areas would not be comparable to our data.

Among the 12 areas shown in Table 3, Hawaii ranks third, with Woonsocket, Rhode Island,[2] and Muskegon, Michigan,[3] both having higher rates. Grand Rapids, Michigan, and Richmond, Indiana,[4] immediately below Hawaii had only slightly lower rates.

A conclusion that may be drawn from this comparison is that the caries attack rate in Hawaii for permanent teeth of children 6 to 14 is one of the highest in the nation, but that some other areas have had equal or even higher rates. This statistical representation is certainly no cause for complacency. The problem of improving children's teeth in the Islands remains one of the most pressing in the field of health.

MILITARY DEPENDENTS

In the past, dental hygienists and dentists have observed that the teeth of children in military families from the mainland appeared less carious than of other children in Hawaii. In an attempt to verify these observations statistically, nine public schools on Oahu were selected where in the judgment of school officials the majority of pupils were military dependents.

A comparison was then made between Caucasian pupils 6 to 12 years of age attending two categories of schools—that is,

Table 3 • Number of DMF permanent teeth per person among children 6–14 years of age in the State of Hawaii and other specified nonfluoride areas

Area*	Children 6–14 yrs. in sample	Age at last birthday									Mean 6–14 years
		6	7	8	9	10	11	12	13	14	
Woonsocket, R. I. 1947[2]	5,929	1.53	2.87	3.85	4.57	5.92	7.57	10.36	12.01	14.10	6.98
Muskegon, Mich. 1944–45[3]	3,329	.81	1.99	2.81	3.81	4.91	6.32	8.66	9.98	12.00	5.70
HAWAII, 1958	37,942	.72	1.79	2.78	3.75	5.12	6.48	8.45	10.30	11.36	5.64
Grand Rapids, Mich.[3] 1944–45[4]	15,106	.78	1.89	2.95	3.90	4.92	6.41	8.07	9.73	10.95	5.51
Richmond, Ind. 1947[4]	4,572	1.26	2.50	2.91	3.77	4.75	6.10	8.26	8.90	10.54	5.44
Sedalia, Mo. 1952[5]	820	.38	2.04	2.91	3.64	4.73	5.92	8.65	9.37	9.32	5.22
Providence, R.I. 1952[6]	8,132	.65	1.69	2.59	3.40	4.16	5.23	7.07	8.43	9.55	4.75
Sixteen cities, Calif.[7] 1952–56	25,130	.7	1.6	2.3	3.0	3.7	4.8	6.1	7.6	8.8	4.3
Newburgh-Kingston, N.Y.[8] 1944–46	5,824	.44	1.07	1.98	2.90	3.86	4.85	6.36	7.83	8.55	4.20
New Jersey 1944–46[9]	47,562	.64	1.54	2.32	2.90	3.62	4.42	5.68	7.11	8.12	4.04
Nicollet County, Minn. [10] 1940	2,289	.51	1.43	2.30	2.86	3.39	4.16	5.50	6.32	7.69	3.80
Montgomery and Prince Georges Counties, Md. [11] 1952	11,291	.34	1.08	1.78	2.44	3.19	3.79	5.10	6.36	7.80	3.54

*Some of these areas have fluoridated their water supplies since the dates shown.

Table 4 • Number of DMF permanent teeth per person among Caucasian children 6–12 years of age in public schools attended largely by military dependents and in schools attended largely by other than military dependents, Island of Oahu, 1958

School category	Number 6–12 years in sample	Age at last birthday							Age adjusted 6–12 years*
		6	7	8	9	10	11	12	
Caucasian children in Oahu schools	6,521	.35	1.20	1.85	2.76	3.47	4.17	6.06	2.42
In schools attended largely by military dependents†	2,269	.30	1.04	1.65	2.55	3.23	3.48	5.31	2.15
In schools attended largely by non-military dependents	4,252	.38	1.29	1.98	2.89	3.61	4.52	6.15	2.55

*Adjusted on sample number of children 6-12 years in the two classes of schools combined.
†Schools attended largely by military dependents: Shafter, Aliamanu, Hickam, Nimitz, Pearl Harbor, Pearl Harbor-Kai, Mokapu, Barber's Point and Schofield.

schools attended largely by military dependents and all other schools on Oahu. The comparison was for Caucasians only because most pupils (83.3 per cent) in the "military" schools were of that race. Results are shown in Table 4.

Although differences were not great, the DMF rate was lower for the military children in each age group 6 to 12 years. The age adjusted rate for these ages combined was 2.15 DMF teeth among the military compared to 2.55 among the nonmilitary.

Probably the rates for the two classes of children would have been more pronounced had the comparison been made between strictly military and nonmilitary groups. As it was, some of the Caucasian children in the so-called military group actually belonged to nonmilitary families, whereas some of those in the so-called nonmilitary group came from military families.

Since some of the military group or their parents undoubtedly came to the Islands recently from areas having fluoridated water or water having a high content of fluorine naturally, it is logical that the military group of children as a whole should have fewer carious teeth than the children of Hawaii who have not had the advantage of fluorine. Other factors, such as diet and climate, may also make a difference between the teeth of mainland and Island children. Some evidence indicates that teeth erupt somewhat earlier in Hawaii, thereby being exposed to caries attack for a longer period. This is to be investigated further.

WATER FLUORIDATION

Beginning in the decade of the '40's, numerous areas have added fluorides to the public water supply in an effort to reduce the incidence of dental caries among children. In some of these areas, careful epidemiological studies have been made to measure the effectiveness of such action in caries control. One of the best known is the Grand Rapids-Muskegon study in Michigan for which results covering a ten year period have been published.[3] The study was conducted by the U. S. Public Health Service in cooperation with Michigan agencies.

Partial results of the study are shown by Table 5 in which DMF rates (average number of DMF teeth per person) by age for the City of Grand Rapids before fluoridation in 1944 are compared with rates in 1954 after ten years of fluoridation. Rates for the City of Honolulu in 1958 are also shown. These correspond closely

Table 5 • Number of DMF permanent teeth among school children 6–16 years of age in Honolulu and in Grand Rapids before and after water fluoridation

Age at last birthday	Honolulu 1958	Grand Rapids, Michigan		
		1944*	1954†	Percentage reduction
Children in sample	17,822	17,724	4,542	—
6 years	.65	.78	.19	75.6
7 years	1.77	1.89	.69	63.5
8 years	2.76	2.95	1.27	56.9
9 years	3.72	3.90	1.97	49.5
10 years	5.03	4.92	2.34	52.4
11 years	6.55	6.41	2.98	53.5
12 years	8.32	8.07	3.87	52.0
13 years	10.42	9.73	5.05	48.1
14 years	11.43	10.95	6.78	38.1
15 years	13.00	12.48	8.07	35.3
16 years	12.71	13.50	9.95	26.3

*Before fluoridation.
†After ten years of fluoridation.

Table 6 • Percentage composition of DMF permanent teeth among children 12–14 years of age in the State of Hawaii and other specified nonfluoride areas

Area*	Children 12–14 yrs. in sample	Total DMF teeth	Decayed (D)	Missing (M)	Filled (F)
New Zealand[12] (1950—All areas)	1,455	100.0	10.3	3.4	86.3
Hawaii (1958—All areas)	7,477	100.0	30.9	5.9	63.2
Minnesota[10] (1947—One county)	679	100.0	39.8	6.4	53.8
Illinois[12] (1940—Four cities)	1,338	100.0	40.9	8.6	50.5
New Jersey[9] (1946—All areas)	14,920	100.0	48.8	15.6	36.0
Rhode Island[6] (1952—One city)	2,866	100.0	50.8	15.7	33.5
Indiana[12] (1940—Two cities)	514	100.0	60.5	6.6	32.9
Maryland[15] (1938—One city)	1,856	100.0	55.2	14.1	30.7
Michigan[3] (1945—Two cities)	9,641	100.0	57.1	12.5	30.4
Ohio[12] (1940—Five cities)	2,015	100.0	63.5	10.6	25.9

*Places within states are: Minnesota—Nicollet County; Illinois—Cities of Evanston, Oak Park, Quincy, and Waukegan; Rhode Island—City of Providence; Indiana—Cities of Elkhart, and Michigan City; Maryland—City of Hagerstown; Michigan—Cities of Grand Rapids and Muskegon; Ohio—Cities of Lima, Marion, Middleton, Portsmouth, and Zanesville.

to the rates in Grand Rapids before fluoridation.

After the ten year period in Grand Rapids, a striking reduction in the prevalence of caries in permanent teeth had occurred even among older children whose teeth had already formed or erupted when they began drinking fluoridated water. The percentage reduction in rates varied from 26.3 per cent for 16 year olds to 75.6 per cent for those 6 years old. Fluoridation began after the older group had many of its permanent teeth formed or erupted; on the other hand, the six year olds had been exposed to a lifetime of fluoridation.

These results are in accord with a growing list of comparable studies in various parts of the country. With scientific verification of this nature, no doubt now exists that water fluoridation is highly effective in reducing the incidence of caries among children. Since DMF rates for Honolulu and for Grand Rapids before fluoridation are similar, Table 5 illustrates what might be accomplished in Honolulu by water fluoridation.

DENTAL CARE IN HAWAII AND OTHER AREAS

A part of the data in Table 6 was taken from an article in the *American Journal of Public Health* by John T. Fulton.[12] This author had access to unpublished material in the files of the U. S. Public Health Service in Washington, D.C. The data pertain to children 12 to 14 years of age and the areas specified were all in the nonfluoride category at the time the data were secured. Taking the total number of DMF permanent teeth as 100 per cent, each component of the DMF was extracted as a percentage of the whole.

The proportion of filled or F teeth among the total number of teeth attacked by caries is a quantitative measure of the extent to which treatment is secured for dental caries. As indicated in Table 6, Hawaii ranks higher than any other area shown for the United States. This is in line with results of a recent health survey showing that the people of the Island of Oahu during the survey year averaged 2.9 visits to the dentist per person, whereas on the mainland as a whole the average was only 1.6 visits per person.[13] This finding is also related to the fact that the incidence of carious teeth is greater in Hawaii than on the mainland as a whole.

Even though a high percentage of carious teeth were filled among children 12 to 14 years, well over one third of the teeth attacked by caries remained unfilled or were lost because of caries. This proportion was about the same for the group 6 to 16 years old. Thus, the motivating of people in the state to secure treatment for carious teeth still remains a great challenge.

The extraordinarily high proportion (86.6 per cent) of filled teeth in New Zealand may be explained by the nature of the dental health program there. Certain dental services including fillings, are provided in the schools without cost.[14]

The proportion of DMF teeth that are in the M or missing category because of caries is especially significant because this indicates the end result of uncontrolled caries attack. In general, a high filled rate is reflected in a low missing rate. As would be expected, the proportion missing in Hawaii is lower than in any other area shown in Table 6 except in New Zealand.

DMF RATES BY RACE

Table 7 and Figure 2 show DMF rates by race. Data are shown separately for Japanese, Caucasian, Hawaiian, part Hawaiian, Filipino and Chinese. The classification "all other" includes other races such as Korean, Samoan, Puerto Rican, Negro, and so on, and also racial mixtures that could not be classified as predominantly a single race.

Table 7 • Number of DMF permanent teeth per person among children attending the public schools, 6–14 years of age, by race, State of Hawaii, 1958

Racial extraction	Children 6–14 yrs. in sample	Age at last birthday									Age adjusted 6–14 years†
		6	7	8	9	10	11	12	13	14	
All races	37,942	.72	1.79	2.78	3.75	5.12	6.48	8.45	10.30	11.36	4.68
Japanese	13,536	.82	2.09	3.33	4.51	6.22	7.97	10.22	11.81	13.17	5.57
Part Hawaiian	6,781	.90	2.01	2.83	3.74	5.14	6.72	8.11	9.91	10.45	4.67
Filipino	3,411	.87	2.00	3.04	3.91	5.20	6.14	7.80	9.17	10.53	4.58
Hawaiian	699	1.11	1.73	2.79	4.06	4.49	5.99	8.09	9.12	8.92	4.38
Chinese	1,848	.45	1.42	2.49	3.19	4.76	6.01	7.22	8.86	10.10	4.11
Caucasian	7,953	.38	1.23	1.93	2.78	3.52	4.33	6.43	8.13	9.14	3.41
All other*	3,714	.72	1.74	2.60	3.33	4.83	5.96	7.59	9.01	10.73	4.30

*Includes other races and mixtures that could not be classified as predominantly a single race.
†Adjusted on total of all races 6-14 years in sample.

Race was determined from older school records which indicated race of child and by the familiarity of the dental hygienist making the inspection with the individual families of the community. Ordinarily, a dental hygienist is assigned one or more schools and may work there for a period of years.

Japanese showed the highest caries attack rates and Caucasians the lowest. (Table 7). Age adjusted rates for children 6 to 14 years were 38.8 per cent lower for Caucasians than for Japanese. Part Hawaiians had the second highest rates but with the age adjusted rate 16.2 per cent lower than Japanese. The third

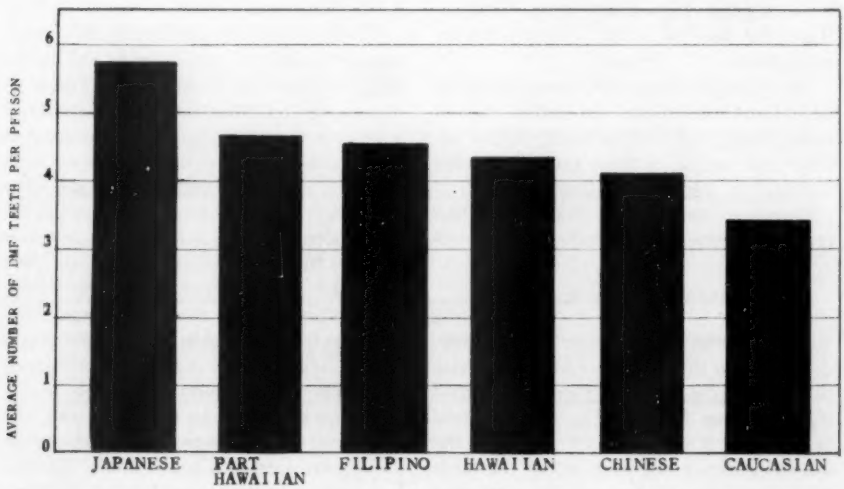

Fig. 2 • DMF rates (age adjusted) by race among children 6–14 years of age attending the public schools, State of Hawaii, 1958

Table 8 • Number of DMF permanent teeth per person, percentage of individuals with DMF teeth, and percentage of DMF teeth filled among children 6–14 years of age attending the public schools by area, State of Hawaii, 1958

Area	Children 6–14 years in sample	Age at last birthday									Age adjusted 6–14 years†
		6	7	8	9	10	11	12	13	14	
		(a) Average number of DMF teeth per person									
State	37,942	.72	1.79	2.78	3.75	5.12	6.48	8.45	10.30	11.36	4.68
Honolulu	16,369	.65	1.77	2.76	3.72	5.03	6.55	8.32	10.42	11.43	4.66
Suburban and rural Oahu	11,289	.66	1.67	2.53	3.50	4.72	5.56	7.47	9.64	10.42	4.25
Neighbor Islands	10,284	.90	2.00	3.17	4.11	5.79	7.32	9.37	10.54	11.77	5.13
		(b) Percentage of children with DMF teeth*									
State	37,942	33.4	66.5	82.9	89.8	94.2	96.1	97.3	98.4	98.5	81.2
Honolulu	16,369	30.3	65.5	83.6	90.6	94.6	96.7	97.5	99.0	98.8	81.0
Suburban and rural Oahu	11,289	30.9	64.3	77.2	87.2	93.7	94.2	95.6	97.3	97.6	78.8
Neighbor Islands	10,284	42.0	71.3	89.7	92.0	96.1	97.2	98.3	98.5	98.6	84.7
		(c) Percentage of DMF teeth filled (F ratio)									
State	37,942	41.4	55.9	60.6	62.8	63.5	63.7	61.9	64.0	63.5	62.2
Honolulu	16,369	53.9	69.5	74.3	74.9	75.2	75.5	75.4	72.4	73.7	73.8
Suburban and rural Oahu	11,289	31.2	46.8	53.3	55.5	55.4	56.9	55.0	57.0	51.2	54.2
Neighbor Islands	10,284	35.5	43.9	46.8	51.2	52.6	51.3	55.3	59.4	56.4	52.9

*Includes all children with one or more DMF teeth.
†Adjusted on State totals in sample 6-14 years of age.

highest rates were for Filipinos followed by unmixed Hawaiians and Chinese. Rates for the "all other" group were intermediate.

No objective data exist to explain these significant differences in caries attack rates among the various races of Hawaii. Since the people of these races are living together in the same setting, a great opportunity exists for research studies on the reasons for the differences.

LOCAL AREAS COMPARED

Table 8 shows data by age for the state divided into three areas—namely, Honolulu City, suburban and rural Oahu, and the Neighbor Islands. The age adjusted DMF rate at age 6 to 14 years for the City as indicated in part (a) of the table was about the same as for the state as a whole with suburban and rural Oahu somewhat lower and the Neighbor Islands somewhat higher.

These minor but significant differences may be explained to a large extent by the racial composition of each area. The population of the Neighbor Islands contains a greater concentration of Japanese and other races having high caries attack rates than do suburban and rural Oahu. For example, of the children 6 to 14 inspected in the dental caries survey, 44.4 per cent on the Neighbor Islands and only 18.4 per cent in suburban and rural Oahu were Japanese. On the other hand, 39.2 per cent in suburban and rural Oahu and only 9.5 per cent on the Neighbor Islands were Caucasians who have the lowest caries attack rates. In the same way, the particular racial composition of Honolulu City, consisting of a more evenly divided representation of races, tended to bring about an intermediate caries attack rate.

Part (b) of Table 8 indicates percentages of children having one or more permanent teeth attacked by caries. The age adjusted percentage for ages 6 to 14 years was highest for the Neighbor Islands, lowest for suburban and rural Oahu, and intermediate for Honolulu City which corresponds to the alignment of DMF rates noted for these areas. The differences between the Neighbor Islands and either of the two other areas were most pronounced at the younger ages.

Part (c) of Table 8 gives by age the F ratio or proportion of all DMF teeth that were filled (F). Figure 3 shows graphically the percentage filled for children 6 to 14 in each area compared to percentages decayed (D) and missing (M). At all ages shown in Table 8, the F ratio was strikingly higher for Honolulu City than for either the rest of Oahu or the Neighbor Islands, indicating a high degree of dental care for children in the city schools. The rest of Oahu, that is, suburban and rural Oahu, averaged only slightly better than the Neighbor Islands and at some ages had a lower F ratio.

Probably the major factor bringing about a much greater volume of dental care in Honolulu City was the more convenient availability of dentists. In the other areas, distances were usually greater to the dentist's office and public transportation facilities less numerous. Other factors may also have played a part, such as more concentrated dental health education in the City, economic circumstances, and the parents' general level of education.

CATHOLIC SCHOOLS

When DMF rates for 1,439 children aged 10 to 14 years attending Catholic schools were compared with similar rates for 17,227 children of the same age in the public schools, the Catholic school children had slightly lower rates at each age. This comparison, however, did not appear satisfactory because the racial composition of parochial school children is quite different from that of public school children. As indicated previously in Table 7, rates for the various races are divergent.

Table 9 gives a comparison between

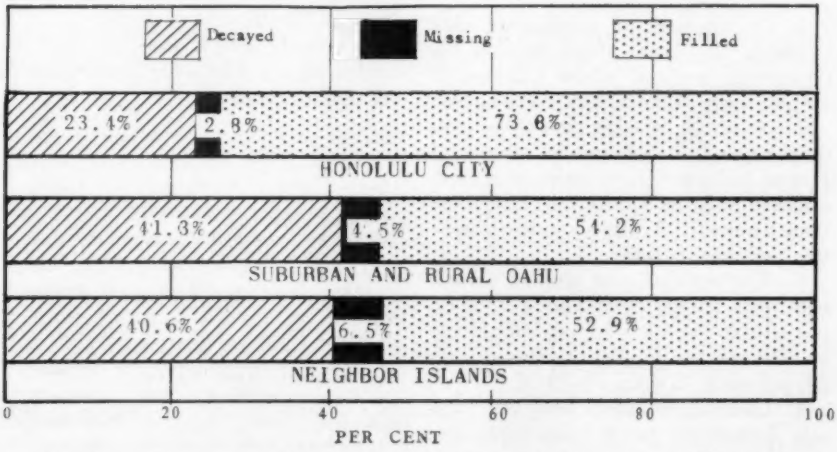

Fig. 3 • Percentage composition (age adjusted) of DMF teeth by area among children 6–14 years of age attending the public schools, State of Hawaii, 1958

Table 9 • Number of DMF permanent teeth per 100 erupted teeth adjusted for race among children 10–14 years of age attending Catholic schools and public schools, State of Hawaii, 1958

Type of school	Children 10–14 years in sample	Age at last birthday					Age adjusted 10–14 years*
		10	11	12	13	14	
Catholic	1,439	22.9	26.7	30.2	33.1	37.8	29.0
Public	17,227	25.2	27.1	32.0	37.3	40.8	31.3

*Adjusted to totals of Catholic and public schools combined for ages 10-14 years.

Catholic and public schools by means of race adjusted rates—a statistical device for minimizing the effect of differing racial distribution. These rates like those without adjustment were somewhat lower at each age for Catholic school children. This indicates on the basis of available data that if racial composition had been exactly the same in both groups, the teeth of Catholic school children would have been to a minor extent less carious than those of public school children. In more specific terms, the race and age adjusted rate for children 10 to 14 years as a whole was 7.3 per cent lower in the Catholic schools.

SUMMARY

1. On the basis of comparative data available, the caries attack rate on the permanent teeth of school children in Hawaii is one of the highest in the nation.

2. At age 16, 98.8 per cent of the children studied in the public schools of Hawaii had one or more permanent teeth attacked by caries. Conversely, little more than 1 out of 100 at this age had caries-free permanent teeth.

3. The percentage of erupted permanent teeth having decay varied from 7.6 per cent at age 5 to 47.7 per cent at age 16. The average number of decayed teeth per person at 16 years was 13.36.

4. Caucasian children who were military dependents had a lower caries rate than other Caucasian children belonging to nonmilitary families.

5. On the basis of experience in Grand Rapids, Michigan, the City of Honolulu might reduce the prevalence of caries among children by as much as 75 per cent through the fluoridation of water.

6. An index of dental care for carious teeth among school children in Hawaii is very high compared to Mainland areas.

7. Children of Japanese extraction have the highest caries attack rate and Caucasians the lowest.

8. At least partly because of racial composition, the Neighbor Islands have the highest caries attack rate and suburban and rural Oahu the lowest, with Honolulu City intermediate.

9. Dental care for carious teeth among school children is more widespread in Honolulu City than in either the rest of Oahu or the Neighbor Islands.

10. Caries attack rates in Catholic schools appear somewhat lower than in the public schools.

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Antarctic stress and the teeth

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The effect on the dental structures of the stresses of living through an Antarctic year has been mentioned by several South Polar explorers. Cherry-Garrard,[1] on Scott's last expedition, described an incident in which his own pulpless anterior teeth split during a rest period on a traverse. He describes the weather as windless but "our breath crackled as it froze."

Amundsen[2] wrote of the need for adequate dental first aid equipment, and Frazier,[3] a physician at Little America with Admiral Byrd during the 1939-1941 expedition, stated, "Most of our problems, medically, were teeth." Frazier continues to say that as the cold increased with the coming of winter, the alloy fillings contracted and pulled away from the cavities they were protecting. Another observation made by Frazier was that teeth with gold inlays became very painful on exposure to low temperatures.

While "wintering over" at the South Pole, Siple[4] said, "There's been a lot of pooh-poohing about the belief that cold weather causes fillings to drop out of the teeth. But usually there is a lot of tooth trouble on these expeditions. Perhaps it is because as your nose tissue gets cold, it becomes easier to breathe through the mouth, and pretty soon there is a differential reaction between teeth and fillings. Then a filling comes out."

Giaever[5] remarked on the deplorable state of oral hygiene noticed in his personnel and stated that "the toothbrush remains for most rather an instrument for use on ceremonial occasions."

In gross observations made at McMurdo Sound, Antarctica, during the 1956-1957 expedition, Knoedler and Stanmeyer[6] reported the loss of fillings, but in almost every instance were able to explain the loss in terms of secondary decay, occlusal trauma or some other physical reason.

The 1957-1958 expedition to Antarctica offered an ideal opportunity to study the effect of the stresses of Antarctic liv-

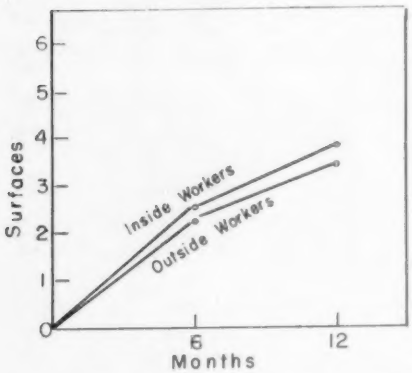

Fig. 1 • Rate of initial caries formation in outside and inside workers

ing on the teeth. At the suggestion of the International Geophysical Year Committee, and with the help of the National Research Council, Committee on Dentistry, a program was organized to observe the tooth-cariogenic-filling relationship at Little America.

METHOD

One hundred and nine men were stationed at Little America, Antarctica. Of this total, 104 men were kept under close dental observation for 14 months. The mean age of this group was 28.3 years with a range from 18 to 56 years.

Prior to leaving for the Antarctic each man was given a thorough clinical and roentgenographic examination, the results of which were carefully charted. In addition to this examination an estimation of the subject's oral hygiene was made using a good-fair-poor criterion. A "good" classification meant that the examiner was unable to remove debris from any tooth using a no. 7 explorer; a "fair" classification meant that debris could be removed from a posterior tooth, and a "poor" classification indicated that debris was removed from an anterior tooth as well as a posterior tooth.

The importance of dental care, and particularly oral hygiene, during the forthcoming Antarctic expedition was discussed at this initial visit. Each patient was presented with a new toothbrush[7] and given detailed instruction on its use. In addition to this individual instruction, small group instruction on the care of the teeth was given through lectures and films. It was not possible to complete all operative work while still in the United States, but all teeth that needed immediate attention were filled in this first and subsequent visits before leaving for the ice.

Upon arrival at Little America, and each month thereafter for at least 12 months, each man was given a careful clinical examination, and the cleanliness of his oral structures was reassessed. Full mouth roentgenograms were taken at six month intervals, and instructions in oral hygiene were continued on an individual basis. All examinations, clinical and roentgenographic, and estimations of oral cleanliness, both in the United States and at Little America, were done by one dentist who accompanied and lived with this group both in the United States and Antarctica for over a year.

RESULTS

Dental cariogenic rates were tabulated as initial decay on previously sound surfaces and recurrent decay occurring around the margins of previously placed fillings.

In the 104 men kept under observation, there was a mean increase of initial decay of 2.4 surfaces per man at the six-month examination and a further increase to 3.6 surfaces of initial decay per man after a year in Antarctica. Distribution of these new carious lesions between those persons whose work was primarily outside in the cold as compared with those whose duties were indoors was 3.4 for the outside workers and 3.8 for the men working indoors (Fig. 1).

With respect to recurrent decay occurring around the margins of previously placed fillings, at six months there was an increase of 1.2 areas per man which climbed to 2.1 at the 12-month examination period. When the recurrent cariogenic rate of outside workers was compared with inside workers, no significant statistical difference was found. A composite of total decay, both initial and recurrent, is shown in Figure 2.

In addition to initial and recurrent decay, there was a total of six fractured fillings and three fractured teeth which were not the result of a cariogenic process.

Oral cleanliness was remarkably improved between the initial examination before leaving the United States and the final examination after more than 12 months at Little America. Initially, the personnel had been classified as 29 per cent good, 56 per cent fair, and 15 per cent poor. Figure 3 shows the monthly estimation of oral hygiene through 10 months in Antarctica. All monthly examinations were accomplished without previous reference to the patients' records or the population trends.

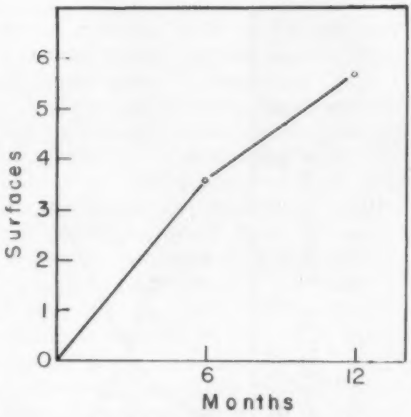

Fig. 2 • Initial decay plus recurrent decay in Little America personnel for one year

DISCUSSION AND CONCLUSIONS

The rate of formation of new carious lesions has been studied by several investigators.[8-10] Their results varied from 1.5 new lesions per year in one college freshman group to 2.2 in another. Hollander and Dunning reported a mean of 1.75 new carious lesions per year in a mixed age group of more than 12,000 persons. All of these studies were on groups usually thought to be in the "caries active" period of life. Subjects ranged from 13 year old school children to young adults just entering college.

The usual presumption is that with increasing age, caries activity in the form of initial decay slows down. This has been attributed to such factors as elimination of surfaces available for initial decay through previously placed fillings, from changes in diets high in carbohydrate to those high in protein, and maturation of the enamel itself.

The literature seems devoid of reliable statistics on the rate of caries formation in groups with an older mean age. It would appear, though, from present knowledge of caries active periods in people's lives, that the mean caries rate would be lower than the rates for younger groups. This was not true of the group living under the stresses of Antarctic life. The rate established in the 18 to 56 year old group was 3.6 new decayed surfaces per year.

The explanation for this high cariogenic rate has not been established definitely. Data presently being compiled on *Lactobacillus acidophilus* counts show that in the first four months when most of the personnel worked outside in the cold, there was a significant drop in numbers of these bacteria per man to levels considered noncariogenic. As the winter night progressed and only those persons whose work demanded their venturing into the cold went outside, the bacterial counts rose considerably higher than the initial stateside counts and were in quan-

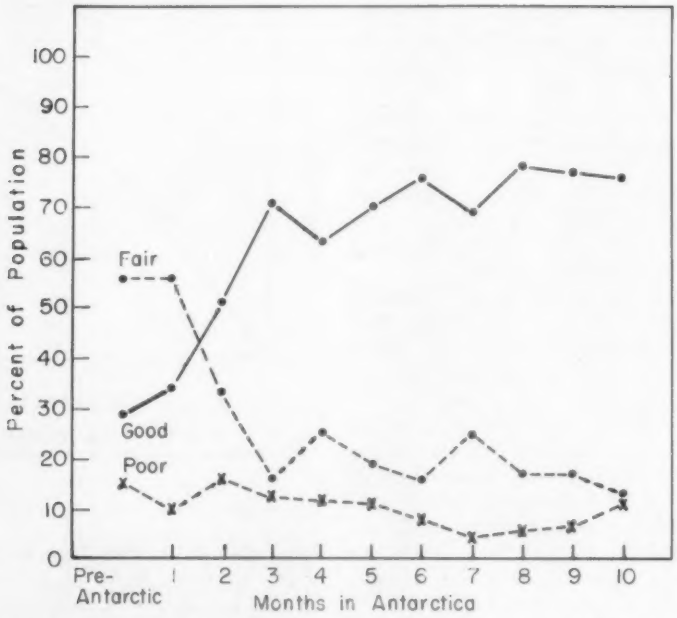

Fig. 3 • Monthly estimation of oral cleanliness expressed in terms of per cent of total population

tities considered to indicate cariogenicity.

Bacterial activity, in terms of acid production in plaques,[11] was also measured and showed that surface chilling of the teeth occurred when working outdoors. Temperatures were reached at which bacterial activity ceased. This may explain the differences in initial caries activity noted between indoor and outdoor workers. The rate of the outdoor workers was consistently lower and may be accounted for by the fact that the cold air prevented acid production in dental plaques and consequently the preliminary process of enamel decalcification was slowed down.

Diets were well planned. Quantities available for consumption were voluminous, and quantities consumed were fantastic. An "open galley" was maintained. Bread, crackers, jelly, peanut butter, cakes, pies, cold cuts and cheeses were available at all times. There was an abnormal amount of eating between meals to relieve the boredom of Antarctic life, and this may have been a contributing cause to the increased cariogenic rate.

Campbell[12] has offered another explanation for increased cariogenic rates. His work showed trends in which the onset of dental caries correlated strikingly with periods of anxious tension which arose from difficulties in interpersonal relationships, particularly those involving dependency on others or aggression against others.

Living through an Antarctic winter presented tremendous problems of dependency. Failure to perform individual tasks endangered the lives of all. These feelings of dependency were extended to individual relationships since a "buddy"

system had to be used to protect individuals when venturing outside.

With isolated living and the knowledge that escape from their situation was impossible until after the winter period, and with little variation in daily routine, aggressive tendencies developed between individuals or groups of individuals. One man may have become irritated over another man's laugh; a group working daily in preparing meals may have been irritated by lack of success of another group in communication to transmit messages, even though the limiting factor may have been the weather. There was no escape by individuals or groups from these situations since their living was so intensive and there was no place to go to relieve these tensions. Attempted measurements of these dependency and aggressive tendencies were made and are in the process of being analyzed.

The lack of differences for recurrent decay found around the margins of fillings in the mouths of inside and outside workers indicates that there is no significant relationship between cold and its effect on coefficients of expansion of filling material and tooth structure as related to decay. However, there may be some relationship between severe tooth chilling and the splitting of teeth and fillings. In six instances fillings fractured after exposure to cold, drinking hot coffee and then biting on something hard like a roll or candy bar. In three other instances teeth containing fillings split when the subject had worked in temperatures down to —50°F. for several hours and then bit on something hard. In each instance the trauma was minimal and resulted in the loss of a cusp. Subsequent examinations of the teeth did not reveal the presence of secondary decay under the cusp which might have accounted for the fracturing.

These experiences may explain in part the misfortune of Cherry-Garrard and his split teeth, in that in addition to the severe cold the teeth in his case had had their pulps removed, making them still more prone to fracturing.

The precautions taken in our instituting an intensive oral hygiene program were reflected in tooth cleanliness. The per cent of men graded as "good" rose sharply during the first three months, and they stayed "good" for the remainder of the time in Antarctica. Unfortunately, the program appeared to exert more influence on the men initially marked "fair." It was chiefly from this group that the increasing numbers in the "good" group came. The group marked "poor" stayed poor regardless of the amount of instruction received from the dentist. The results of the entire oral hygiene program, however, illustrated the beneficial effects of the close patient-dentist relationship possible under the condition of isolation experienced while living together for a year in Antarctica.

SUMMARY

A study has been made of the effects on the teeth from the stresses of living through an Antarctic year. Initial cariogenic activity continues despite the severe cold. A measurable difference exists between those persons whose normal activity confines them to shelters, 3.8, as compared with those persons exposed to extremely low temperatures, 12 to 14 hours per day, who showed 3.4.

Recurrent decay around the margins of fillings remained the same in both the inside and outside workers.

Tooth splitting, amalgam fracturing or amalgam loss occurred infrequently and then only when rapid changes in oral temperature were accompanied by trauma.

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The geriatric patient in the office

Marcelle Bernard, M.D., and*
William J. Hogan,† D.D.S., New York

Today, elderly patients are in stronger physical condition than their predecessors, and are more apt to be office patients. Loss of teeth in the geriatric patient decreases the masticatory effect, is unpleasant cosmetically and contributes to a speech defect. The geriatric patient, by virtue of his seniority, should be treated with more than ordinary care and patience, and receive the fullest extent of understanding and tenderness from dentist and physician.

A new group of patients has been added to the office practice. This new group falls into the geriatric category. Not too many years ago the geriatric patient was not a regular office patient. Many practitioners' only experiences with the elderly patient were when the patient was too feeble to leave home or was institutionalized. Today, the elderly patient reaches his middle 60's in stronger physical condition than his predecessors and this improved physical status allows him to continue to be an ambulatory office patient. Statistics show that seven out of eight men and women past 65 years of age are capable of performing the activities of daily living.

The geriatric patient displays (in the private office) certain idiosyncrasies that must be understood by the doctor. Attention to the little things is of utmost importance. Among the most common complaints of the elderly patients are impaired hearing and vision, loss of teeth with subsequent difficulty in mastication, painful feet and bowel irregularity. These complaints should not be glossed over as due to old age, but corrective therapy should be instituted for the patient's medical well-being as well as for his mental outlook at this critical time of his life.

Loss of teeth in the geriatric patient has many harmful effects. First, there is a definite loss of masticatory effect at a time when his diet demands an increased

proportion of protein, calcium and iron. The geriatric patient must maintain a well-balanced diet with sufficient protein. Protein strengthens bone and muscle including the bones of the upper and lower jaws and the muscles of mastication. Since meat is a chief source of protein it is essential that proper oral care of the patient be initiated and the remaining teeth placed in a healthy condition. Periodic care can be given to the supporting soft tissues and missing teeth replaced with functioning prosthetic appliances.

Loss of teeth also has an unpleasant cosmetic effect that renders the individual most self-conscious.

Finally, loss of teeth leaves the patient with a definite speech defect that is harmful to the patient's mental outlook and does nothing to maintain the patient's ego and motivation forces.

"The attrition of time or normal aging brings about certain definite physiological changes. Particularly evident are those changes involving the bones, the teeth and corrective tissue."[1]

The physiologic changes in the geriatric patient are motor and sensory. The basal metabolic rate is decreased, the endocrine glands can stand less stress, and the senses are dulled. It is because of these physiologic changes that the geriatric patient in the private office must be treated with certain departures from the norm.

A case in point is an 85 year old woman whose chief diagnoses are generalized arteriosclerosis and osteoarthritis. Office treatment of this type of patient is time consuming and arduous, not because of the therapy involved but because of the patient's slowness of movement and her particular loquacity. The majority of geriatric patients are slow moving and this must be considered when scheduling appointments. Inclement weather, also, will play havoc with an appointment book that features a large number of geriatric patients. Physical infirmities of these senior citizens tend to disrupt the usual office routine, but every consideration in time and effort must be given to them.

Procedures must be done according to the various physical capacities of the patients. This must be remembered as long as the patient is an ambulatory private office patient since the trip to the office is often a taxing experience and is a further drain on the patient's physical reserve.

In general, the treatment of elderly patients in the office should include the following points:

1. Minimal dosage of drugs should be employed, particularly barbiturates and narcotics. Alcohol, in moderation, is an extremely useful adjunct in the management of senescent patients.[2]

2. Lengthy procedures should be avoided because of lack of muscle tone, stiff joints and diminished cardiovascular reserve.

3. Minor surgical procedures in the office should be just that. Slow repair and healing are common in the geriatric patient[3] and excessive bleeding is dangerous. Increased capillary fragility in aged patients must be remembered.

4. Since mental confusion is often a symptom in the elderly, written instructions for home medications are of great value to the patient and save time for the doctor, eliminating repeated telephone calls.

5. Because of the possible mental confusion it is wise to appoint one member of the family to act as "home nurse and doctor's secretary." The principal duty of this person is to see that the written orders are carried out and not left to the patient's discretion, and to handle all communications with the doctor relating to the patient's progress.

6. Ample time must be allotted for the office geriatric patient. This is a "must" because geriatric patients move slowly. They take longer to disrobe for physical examinations; they take longer to tell their symptoms for the case history; they react considerably more to procedures in-

volving instrumentation, and need time to settle down after instrumentation. On leaving the treatment room, geriatric patients frequently must be allowed time to regain their composure, both physical and mental. The geriatric patient should not be rushed.

The physical set up of the office itself must receive additional consideration. Senior citizens often use the furniture as aids in sitting down and on arising, so it is well to have heavy type furniture that cannot be moved easily. Sturdy chairs with arms and heavy legs are best. Non-slip rugs are of primary importance. Doors that open and close easily eliminate extra effort and reduce the possibility of office accidents.

The geriatric patient is basically the same as patients in other age groups. All age groups have their peculiarities and foibles but all are human beings who seek medical aid for real pathological conditions. True, some patients, and this applies to all age groups, seek aid for imaginary ailments. The same yardstick for treatment is given to all but it is suggested that the geriatric patient, by virtue of his seniority, be given just a little more time, be treated with a little more care, be handled with a little more patience, and be given the fullest extent of the doctor's understanding and tenderness.

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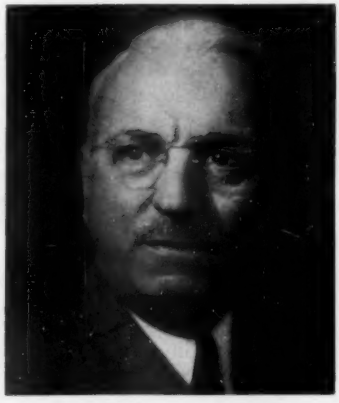
Harvey Benson Washburn,
Association treasurer, retires

Having given to the American Dental Association twenty-one very long, very active and frequently very demanding years, Harvey Benson Washburn of St. Paul retired last month as treasurer of the Association, a position which he held since 1949.

Ever since he entered the profession, following his graduation from the Dental School, Northwestern University in 1905, Dr. Washburn has been most active in the affairs of organized dentistry. In 1916 he became secretary of the St. Paul District Dental Society and in 1917 he became its president. The Minnesota State Dental Association honored him with its presidency during 1923-1924 and in 1926 he served as chairman of the Full Denture Section of the American Dental Association. In 1940 he was elected a member of the Board of Trustees of the American Dental Association and served two terms in that capacity. In 1947 he was elected to the office of president-elect of the American Dental Association and assumed the presidency in the fall of 1948. At the conclusion of his presidential year he was appointed



Harvey Benson Washburn
Treasurer, 1949-1961

to the office of treasurer of the Association, the duties of which he performed with distinction for 12 years.

In accepting Dr. Washburn's decision to retire, the Board of Trustees of the Association expressed their profound appreciation for his many years of service to the profession and particularly to the Association. During his 12 years as trustee he helped guide the Association to a position of financial security as its total assets increased during his tenure from $1,097,000 to $6,300,000.

Despite the many hours and the close attention which he gave to Association affairs, Dr. Washburn found time to build a successful and gratifying private practice in St. Paul.

His long and productive career exemplifies an age old tenet of a professional organization: "Not, what can my Association do for me, but what can I do for my Association."

Continuing education: goal of graduates at University of Tennessee College of Dentistry

The members of this year's graduating class at the University of Tennessee College of Dentistry are to be congratulated for having established a precedent in educational circles by setting for themselves a goal which, it is hoped, other dental schools will soon follow. Unanimously the students pledged to return to their own or to some other dental school at least once every two or three years for graduate or postgraduate training.

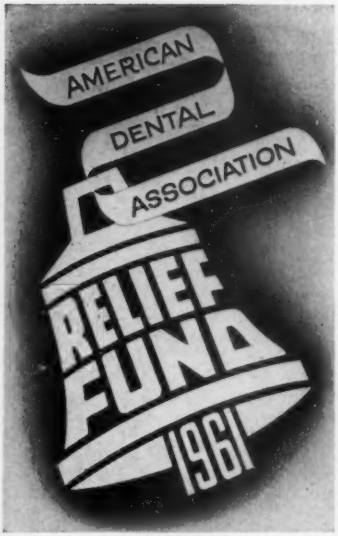
This enlightened action sets an example which, if adopted by other classes in other schools, will provide an educational stimulus to all members of the profession. Furthermore, it will result in the establishment of means by which all dentists can keep better informed concerning the latest developments in dental practice, thus making it possible to provide more and better dental care to more patients.

Dean Shailer Peterson, in congratulating his students on their prescience, said in part:

"To the best of my knowledge this action has never before been taken by any group of dental students, or students of any other profession. You are indeed to be complimented on this foresighted professional spirit as it demonstrates that you recognize an important dimension in your future role as professional men."

The Tennessee graduates' pledge is indicative of the caliber of today's entrants into the profession. It attests to their perspective and to their acumen. It is a notice to dental educators that the practitioners of tomorrow will make ever increasing demands on the schools for more and better courses in advanced dental education.

The faculty at the University of Tennessee College of Dentistry deserves full recognition for having instilled in their students this high regard for continuing education. It is to be commended for having prepared the soil in one field of dental education so thoroughly that its students have been motivated to plant a seed which, with proper cultivation and firm guidance, may well bear fruit of great promise.



The American Dental Association Relief Fund: the distress you ease may be your own

This month the Association launches its forty-ninth annual Relief Fund campaign. Again this year the goal is an extremely modest $125,000. One half of the contributions is returned to the states from which they come. One half is added to the American Dental Association Relief Fund of which only the income can be used for relief purposes. Last year the relief program provided more than $132,000 to 134 recipients whose ages ranged from 25 to 93 years.

To a few of the more self-sufficient in the profession it may seem incredible that a dentist, under present economic conditions, would need financial assistance. To the more understanding, however, comes John Bradford's famous phrase "There, but for the grace of God, go I." Any member given the opportunity of reviewing some of the applications for assistance could readily imagine how he, himself, might be placed in similar circumstances. Imagine:

You are 35 years old. You have been practicing for ten years. You have a wife and two small children. Your latest equipment is all but paid for. You have just made a substantial down payment on a modest home in one of the better neighborhoods of your community. You enjoy a good practice, a good reputation and good credit. Suddenly polio strikes. Three members of your family, your wife, your seven year old son and yourself require months of hospitalization. You are faced with mounting medical expenses. Your income is completely shut off. Your insurance runs out. Your mortgage is foreclosed. Your small savings are depleted. You have nowhere to turn but to the American Dental Association Relief Fund for financial assistance.

It won't happen to you? No? Fate forbid that it ever happens to you and your family. But it has happened to others.

You are 50 years old. You enjoy a fine practice. You have an invalid wife and four children: one married, two in college and one in high school. Your home and your office are paid for. You are completely out of debt, that is, except for a substantial loan which you made to help finance two children through college and to pay the hospital bills for the birth of your latest grandchild. Suddenly you are stricken with a severe heart attack causing complete and permanent disability. Your practice, income, home, savings, and insurance are completely wiped out. You have nowhere to turn but to the Association's Relief Fund for assistance.

It won't happen to you? Probably not, but it has happened to others who are just as strong and just as capable and just as self-sufficient as yourself.

> You are 67 years old. All your life you have enjoyed a modest, not overly lucrative practice. You have spent so much time looking after the welfare of your patients that you have failed to look after the welfare of your wife and yourself. Long since you have had to discontinue certain phases of practice because of pains in your shoulders and elbows and knuckles. Now your gnarled fingers will no longer hold instruments and you can no longer hold patients. The office must close. The income must end. The many patients that you carried for so many years will not, of course, carry you. You cannot turn to them but you can turn to the American Dental Association Relief Fund.

It won't happen to you? Perhaps not. But it has happened to others and it will happen to more this year and next year and for so long as dentists are dentists and for so long as dentists are average human beings.

Remember that November is the month of thanks giving. Back your grateful words of thanks for your many blessings with a gracious contribution to those who are less fortunate. Today, mail at least a five dollar bill or a five dollar check to the American Dental Association Relief Fund, 222 East Superior Street, Chicago 11. And in doing so paraphrase to yourself the popular expression, "The distress you ease may be your own."

House takes firm stand on therapeutic dentifrices

Twice within the past twelve months the House of Delegates of the Association approved the action taken by the Council on Dental Therapeutics concerning Crest, a stannous fluoride-containing dentifrice. On October 20, after a full half day and more of consideration in reference committee, followed by a two hour discussion on the House floor, the delegates, by a vote of 292 to 72, sustained the right of the Council on Dental Therapeutics to evaluate and classify dentifrices and other over-the-counter products, and to inform the public of such classifications. In 1960, at its 101st annual session, the House, by a 279 to 94 vote, also upheld the Council's program.

The reference committee's report to the House noted that "no scientific evidence was introduced to refute the basic background for provisional approval of the anti-caries dentifrice." The committee also stated that the proposed change "would nullify the years of effort which the Council on Dental Therapeutics and the Association have exercised in trying to influence the advertising of dentifrices so that the public could rely on truthful and honest claims made in acceptable advertising." To strengthen further the Council's efforts in this regard, the House directed the Council "to take all necessary steps to prevent the misinterpretation through advertising of its actions on therapeutic agents, particularly dentifrices, by the public."

Although the Council's recognition of Crest has elicited some unfavorable reactions from a few within the profession, it has resulted in favorable reactions outside the profession. It has stimulated the public to devote more time and attention to mouth hygiene, it has stimulated other dentifrice manufacturers to devote more time and attention to scientific research, and it has had a beneficial effect on dentifrice advertising generally. In the end the public will profit.

international dentistry

News from Great Britain

British Dental Association • The 81st annual conference held at Harrogate last June was a great success both financially and scientifically. Honorary degrees were conferred by the chancellor of the University of Leeds (H.R.H. The Princess Royal) on Professor Lester Cahn of New York, Professor Jens Waerhaug of Oslo University and the new president of the Association, Percy Cocker.

Dental Health Education • An editorial in the *British Dental Journal* of July 18 deals with dental health education and contains the following passages:

"From the middle of the eighteenth century onwards books by the score have been written in the English language on dental health and the methods necessary to maintain it. The B.D.A. soon after its inception began to draw the attention of the Government to the great need for widespread instruction in oral hygiene and many members individually have endeavoured by various means to interest the public and the press in dental health education.

"The inception of what was to become the school dental service by the appointment in 1885 of a school dentist to North Surrey District Schools, began to draw to the attention of the public the necessity for educating children in the principles of oral hygiene.

"The inauguration of the Dental Board of the United Kingdom in 1921 gave an opportunity for the profession to do something practical on a wide basis, and in 1925 plans were made for the provision, at the Board's expense, of speakers on dental health in many parts of the country where an audience of children or adults could be organised locally.

"It is necessary that any form of education shall be continuously in action because the population is incessantly renewed. . . . By an intensive campaign through the press and other means of widespread communication, a national awareness of the fact that most dental disease is avoidable could be established and such a campaign is very much overdue.

"The Oral Hygiene Service, by capturing the attention of large groups of the population, is spreading knowledge of simple measures of hygiene especially among young people. Industrial firms in increasing numbers provide dental clinics at factories and the presence of these reminds the employees of the necessity for dental care.

"Within the profession the General Dental Council continues the work begun by the Dental Board though in different lines, and the Association is establishing a Dental Health Bureau which, it is hoped, will co-ordinate and supplement the work already being done. If the bureau can find enough capital to establish a constant supply of material for what has now become one of the most pressing health needs of the country, an incalculable benefit will result.

"Gradually, the ideas advocated by the profession in the latter part of the last century will be realised in the second half of this; not, however, by the agents who should be mainly responsible. Neither the Minister of Health nor the Minister of Education has demonstrated any interest of practical value in dental health education.

"At the present time, greater interest is being shown by the public in dental hygiene than ever before and this interest should be fostered by all available means, particularly among children and adolescents. The possibility that the profession might be met with 'a suspicion of self-seeking' no longer exists, for the public now realises that those who accept advice on hygiene and the recommendation to visit a dentist twice a year are likely to suffer less dental disease than they otherwise would, and will therefore need less treatment."

National Health Service • An editorial in the August issue of the *British Dental Journal* commenting on the Report of the Ministry of Health for the year ended Dec. 3, 1960 states:

"The first impression received is of the vast quantity of dental work done and the large amount of money involved: eleven and a half million courses of treatment; fifty and a half million pounds spent.

"The population of the country is, however, about fifty-two million, and when a reasonable assessment is made of the amount of work done outside the Health Service it is clear that, as a large proportion of the courses of treatment was for those who have two each year, less than one-sixth of the population has N.H.S. dental treatment in any twelve months. The yearly cost of Health Service dentistry is less than one pound per head of the population and, lest anyone should feel that fifty million pounds is a crippling sum to spend on the treatment of dental disease, it is as well to remember that in 1959 the nation spent over four hundred millions on sugar, preserves, and confectionery, all of which are recognised as cariogenic agents.

"The volume of treatment given within the N.H.S. in 1960 was 'substantially more than in 1959, but it was increasing faster than in preceding years.' The number of dentists within the Service also increased but whereas this was only a little over 1 per cent, the volume of treatment provided (measured by the number of completed courses) increased by 7.2 per cent.

"About half of all treatment provided (judged by the amount of fees earned) was for the priority classes: that is, those under the age of 21, and expectant and nursing mothers. The volume of work done for patients under the age of 21 has greatly increased since 1956; the earliest year quoted in the tables given. This age group is divided into two categories: up to 14 years, and from 15 to 20; the latter figure in each case presumably including the following twelve months. It is interesting to see that the figures for the older group, while lower than those for the younger group in 1956, have gradually overtaken them and now exceed them by over a quarter of a million pounds. In view of the fact that the amount of treatment given to the younger group has also steadily increased during the same time, this expanding demand for advice and treatment may be due in part to the beneficial habit of regular attendance formed in childhood being continued during adolescence.

"The purpose of a progressive dental health service should not be solely to treat an increasing number of diseased teeth but also to reduce the incidence of dental disease. Seeing that at least 98 per cent of the population are prone to dental disease and that much of it is avoidable, the Service cannot begin to assume its proper national function until everyone has been educated in oral hygiene and in the necessity of seeking advice and treatment regularly.

"If this ideal is to be approached, and it can be if the Government so decides, the cost of the Service must increase yearly until true dental health is the rule rather than the exception. It might seem that this would become an intolerable burden upon the State, but such an opinion would depend upon one's estimation of values; against our fifty million pounds for dental treatment, we now spend over two thousand million pounds yearly on tobacco and alcoholic drinks."

Obituary • The dental profession will mourn the passing of John Brodribb Parfitt whose death in his ninetieth year removed one who gave long and distinguished service to dentistry. The profession will remember him as the doyen of teachers in Great Britain, loved by many hundreds of Guys graduates and whose textbook on operative dental surgery is a standard work read by most students.

Items of Interest • The many friends and colleagues of Cyril de Vere Green and Sam Cripps will want to congratulate them on their election to Fellowship in the American College of Dentists.

Louis Grossman of the University of Pennsylvania Dental School gave a most interesting talk last June on "Adventures in Endodontic Treatment" before an enthusiastic audience of London dentists.

The VIIIth Congress of ORCA (European Organisation for Research on Fluorine and Dental Caries Prevention) was held in London under the presidency of Professor Arvid Syrrist of Sweden, and with Miss Jean Forrest of Great Britain as co-president, from July 4 to 7.

The Congress was attended by nearly 200 dental research workers from 16 European countries and from the United States. Over 40 scientific papers covering most aspects of research into dental caries were presented which included two main themes, "The Biochemistry of Normal and Carious Enamel" and "Epidemiological Research," under the chairmanship of Professor Darling and Professor Slack respectively.

The Royal College of Surgeons of England was the site of the meeting.

The world-wide friends and colleagues of Sir William Kelsey Fry will be pleased to know that he is making a slow but steady recovery after his serious illness.

G. H. Leatherman
D.M.D., F.D.S., R.C.S., F.A.C.D.

News from Brazil

Postponements • Several dental conventions scheduled for late August or early September 1961 were postponed because of the political situation following the resignation of President Jânio Quadros. Among the meetings thus delayed were the Eighth Dental Convention of Rio Grande do Norte, the Dental Week of Cariri, the convention of the city of Araçatuba, and a dental week organized by the students of dentistry of the University of São Paulo. However, a meeting planned by the dental student organization of Campinas, the Academic Center October XXV, will take place as planned, October 15-21, in that city.

Mutual Funds and Insurance • The São Paulo State Dental Association is about to organize a mutual fund for the families of dentists. It would be open to those members who wish to join. At the same time, the association's life insurance plan will be up-dated to cope with the increasing inflation.

Honor • Prof. Alfredo Reis Viegas, president of the Brazilian Dental Association, was designated by the Fédération Dentaire Internationale to be its representative at the Medical World Convention, held in Rio de Janeiro, September 15-20, 1961.

Hans Freudenthal, C.D.

International News In General

BRITISH COLUMBIA ADVERTISES TO SOLVE DENTIST SHORTAGE

Advertisements aimed at encouraging more persons to study dentistry have been run in all daily and weekly newspapers in British Columbia, Canada. In addition to solving the dentist shortage, the British Columbia Dental Association also hopes the ads will help maintain the prestige of the dentist in his community.

The copy of the ad reads: "British Columbia needs 200 new dentists—and needs them now. So acute is the shortage of qualified men that many areas of B.C. have no readily available dental service at all. And the trouble is—dentists are not trained overnight. It takes at least six years of intensive university study to become a dentist."

So far more than 200 students have written asking for details. They have all been contacted and referred to dentists in their areas for further consultation. Editorials have appeared in the British Columbia press praising the campaign and drawing the attention of the provincial government and the University of British Columbia to the desperate need for a faculty of dentistry.

CANADIAN DENTAL RESEARCH CONFERENCE HELD IN OCTOBER

The first Canadian Conference on Dental Research was held October 30-31 at the Faculty of Dentistry of the University of Toronto. Arrangements for the conference were made by the Canadian Dental Research Foundation, an affiliate of the Canadian Dental Association, and the conference was financed by a $3,000 grant from the Procter and Gamble Company of Canada Limited.

The main purpose of the meeting was to provide an opportunity for dental researchers to discuss their work and problems. Representatives attended from all six Canadian dental schools, the Royal Canadian Dental Corps and the Department of National Health and Welfare.

ALL INDIA DENTAL ASSOCIATION TO HOLD CONFERENCE IN JANUARY

The All India Dental Association will hold its seventeenth annual conference at Ahmedabad, January 4-6. The program will consist of scientific sessions, business meetings and social functions. Any member of the American Dental Association who plans to be in India during this period is asked to get in touch with the office of Harold Hillenbrand, secretary, at the Central Office, 222 E. Superior Street, Chicago 11.

BOLIVIAN DENTAL ASSOCIATION ELECTS NEW OFFICERS

The Bolivian Dental Association, July 29, elected a new slate of officers. They are: General secretary, Eduardo Quintanilla; secretary of public relations, Guillermo Rios C.; secretary of culture, Oscar Prudencio C.; secretary of internal affairs, Ivar Camponovo M.; grievance secretary, Roger Moreno; secretary of organization, Mario Vazquez; secretary of coordination, Carlos Ardiles I.; recording secretary, Julio Chavez; and secretary of press relations, Ismaél Bascopé.

news of dentistry

Association's program of evaluating dentifrices upheld by House of Delegates

The American Dental Association's program of evaluating and classifying dentifrices and other dental products sold to the public was upheld by the House of Delegates, meeting in Philadelphia, October 16-19, at the 102nd annual session of the Association. The delegates, by a vote of 292 to 72, rejected a resolution which would have taken away the right of the Council on Dental Therapeutics to grant "recognition" to dentifrices. The resolution called for the elimination of Group B (provisional recognition) classification and for the elimination of any mention of American Dental Association recognition in public advertising for Group A (fully accepted) products. In 1960, the House, by a vote of 279 to 94, also upheld the Council's program.

The House did direct the Council on Dental Therapeutics to take all necessary steps to prevent the misinterpretation through advertising of its actions on therapeutic agents, particularly dentifrices, by the public.

The Association's policy on federal aid to dental schools also was reaffirmed by the House when it rejected, 281 to 29, a resolution calling for the disapproval of federal aid to dental schools beyond grants for dental research. In addition, the delegates rejected a resolution which would have disapproved federal grant-in-aid funds for the prevention and control of dental disease and for other purposes.

PRESIDENT KENNEDY'S GREETINGS

President Charles H. Patton read to the House a telegram sent by President John F. Kennedy: "It is a pleasure to extend greetings to the American Dental Association on the occasion of your 102nd annual meeting. Your fine record of professional excellence and vigorous support of progressive measures in dental public health gives promise that still further goals will be attained. As in most health specialties, the great need in the field of dentistry is for more and more highly trained men and women both to seek new knowledge through research and to apply more extensively the knowledge already won through research. I am confident that with your help this need will be met in the years ahead. Best wishes for an interesting and profitable meeting."

ABEL INSTALLED AS PRESIDENT

John R. Abel, an orthodontist from Los Angeles, Calif., was installed as president of the Association, and Gerald D. Timmons, dean of the Temple University

School of Dentistry since 1942, was unanimously chosen president-elect. Dr. Timmons just completed his sixth year as speaker of the House of Delegates.

Also elected by acclamation were the following candidates: First vice-president, Jay H. Eshleman, Philadelphia, general chairman of the Committee on Local Arrangements for the Philadelphia session; third vice-president, Howard B. Higgins, Spartanburg, S.C., former trustee from the Fifth District. Elected unanimously to return as trustees: Sixth District, E. Jeff Justis, Memphis; Seventh District, Maynard K. Hine, Indianapolis, dean of the Indiana University School of Dentistry; and Tenth District, Henry M. Willits, Dubuque, Iowa.

Sau Yee Chang of Hawaii was elected second vice-president; Floyd D. Ostrander, Detroit, former chairman of the Council on Dental Therapeutics, was elected speaker of the House; and Hubert A. McGuirl, Providence, R.I., was elected trustee from the First District.

PRESIDENT'S ADDRESS

In the President's annual report to the House of Delegates, outgoing President Charles H. Patton called on the House to support the Association's right to address the American public freely and honestly in matters relating to dental health. He cited the terrific pressures which were brought on the House relative to the action which it took last year in supporting the program of the Council on Dental Therapeutics.

He said, "It is obvious that efforts are being made to place the Association unwarrantedly in the center of a controversy between competing commercial dentifrice manufacturers. All of these companies have had equal access to the opportunities for dental research and to the evaluation procedures of the Council on Dental Therapeutics.

"The failure of some to accept any responsibility whatever for improving their products by research, and for advertising them honestly to the public, has now placed them in a difficult competitive position . . .

"The Association must resist the efforts of one or more dentifrice manufacturers to influence the opinions of this House and to destroy the program which stands between it and the public health in the area of therapeutic dentifrice claims. The Association must also resist these efforts to restore a competitive position by political action rather than by intensified research. . . ."

President Patton expressed his conviction that House members would review the matter with care, and "examine motives as well as assertions. I am confident that the final judgment of the House of Delegates will sustain the Association's right to address the American public freely and honestly in matters relating to dental health."

OPENING MEETING

At the Opening Meeting of the House of Delegates, Rep. Walter H. Judd called for a middle-road approach to government participation in health programs. He declared: "We medical people tend to focus our attention on the good; under our present system most people have good care. Those who would turn to the government focus on the bad; they would scrap the present system because a minority does not get the care they need. . . . But where we ought to be is between those two—neither the radical who would abandon what we have because it isn't perfect, nor the reactionary who says it's good enough because it's at least better than anybody else has. What we ought to be is what I call progressive-conservatives."

At the opening meeting, Mayor Richardson Dilworth welcomed the Association to Philadelphia, and Lieutenant Governor John Morgan Davis extended the greetings of Pennsylvania.

House of Delegates

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SPECIALTY PRACTICE

The House adopted a resolution stating that after January 1, 1965 all members of the Association who have not previously announced limitation of practice and who desire to announce themselves as limiting their practice exclusively to one of the areas approved by the Association, will be required to complete two or more academic years of advanced education as specified by the certifying boards, essentially all of which must be in or directly related to the selected area, or to possess a state license permitting announcement in an area approved by the Association.

The House referred to the Judicial Council and the Council on Dental Education for study and preparation of a report to the 1962 annual session, a resolution that would rescind the amendment made to section 18 of the *Principles of Ethics* which was adopted at the 1960 annual session. The amendment dealt with the announcement of specialty practice.

The House rejected a resolution calling for the appointment of a special committee to study the problem of specialties and to report to the House at the 1963 session. The delegates also rejected a resolution providing for a questionnaire to be sent to all constituent societies to poll individual members on their feelings on minimum standards of education for specialization.

DENTAL AUXILIARIES

The House approved, as amended by the Reference Committee, the Statement of Policy Regarding Experimentation in Training and Utilization of Dental Hygienists and Dental Assistants which had been developed at a workshop in June 1961.

However, the House urged caution in the interpretation and implementation of the results of research programs on the extension of duties of auxiliary personnel so that unsupervised and unlicensed persons are not encouraged to engage in the actual practice of dentistry.

The House rejected a resolution calling for the Council on Dental Education to develop a questionnaire to be sent to constituent societies so the Council could present a new statement of policy on auxiliary training and utilization.

The following statement on closed panel practice was approved by the House: A closed panel practice is established when patients are obtained through the provisions of an agreement with a given group and when such contract does not provide for the purchase of dental care by the patients from any other source. Because of the essential limitation which this method of practice imposes on the patient, it should be discouraged. Closed panel practices should be established only in special circumstances to meet needs which cannot be met in any other way. When established, closed panel practices should be under the direct supervision of a dentist legally licensed in the state, should conform to the *Principles of Ethics* of the Association and the local codes of ethics and should maintain close liaison with the constituent and component dental societies of the area.

WOMEN'S AUXILIARY

The House rescinded its previous action of 1957 which required the development of the organization of a Women's Auxiliary to the Association on the basis of direct national membership in that auxiliary and not on the basis of a federation of existing constituent society auxiliaries.

The House also approved the revised Constitution and Bylaws of the Women's Auxiliary, as adopted by that group's House of Delegates in 1960.

OTHER HOUSE ACTIONS

The House of Delegates also:

Approved the principle that dental

service corporations should be legally constituted not-for-profit organizations sponsored by a state dental society to negotiate and administer contracts for dental care;

Postponed until the 1962 session a resolution calling for the establishment of a new Trustee District 14 to be comprised of the federal dental services;

Approved the statement on Dental Care in Nursing Homes presented by the Council on Hospital Dental Service and which had been accepted by the Liaison Committee on Problems Concerning the Institutional Care of the Chronically Ill and Aged of the American Hospital Association, American Medical Association and the American Nursing Home Association;

Adopted an amendment to the Bylaws stating that back dues shall not be accepted for more than three years of delinquency prior to the date of application for such payment;

Urged the responsible authorities to expand health insurance contracts under the Federal Employees Health Benefits Act to include coverage of all oral surgical procedures performed in the hospital;

Directed the Council on Legislation to make available to constituent societies information, advice and guidance on areas which are, and should be, covered by state dental practice acts to assure the proper protection of the public and of the profession;

Encouraged every constituent society to establish some form of referral service which will assist the public in obtaining emergency dental treatment;

Directed the Council on Dental Health to survey the few emergency dental treatment programs now operating and to furnish to all constituent societies information they can use as a guide in establishing an emergency dental referral service;

Approved a resolution from the Board that the Association endorse and support in principle the Youth Physical Fitness Program of the President's Council on Youth Fitness and encouraged the constituent and component societies to cooperate with the appropriate agencies toward the development of effective programs for improvement of health;

Urged the American Dental Society of Anesthesiology to develop a conference workshop in cooperation with the Council on Dental Education with the specific objective of developing basic educational requirements for advanced training in dental anesthesiology and requested that progress on this activity be reported at the 1962 session.

At the closing session of the House, retiring Speaker Gerald D. Timmons presented to the Association a gavel which he had designed and which was made of different woods furnished by the constituent dental associations and the federal dental services. Its inscription reads: Presented to the American Dental Association in appreciation from Gerald D. Timmons, Speaker 1956-1961.

1962 BUDGET APPROVED

The Board of Trustees reported to the House that with the increase of $10 in membership dues which became effective in 1960, the Association's operating budget was expanded by almost $250,000 to provide for new and expanded activities. The Board also reported that the Association's financial activities for the year were highly satisfactory and a substantial contribution to the Reserve Division was possible. Income for fiscal 1960 was $102,000 over the budget estimate.

The House approved for fiscal 1962 an operating budget of $3,595,360; an underwriting budget of $323,970; and a capital budget of $104,283. Estimated income for fiscal 1962 is $3,605,370.

The Board also reported to the House that it has appropriated in the 1962 budget $3,000 for preliminary work on a motion picture on dental prosthetics, as directed by the House at the 1960 annual session. The Board also appropriated from the Reserve Division $200,000 to

AMERICAN DENTAL ASSOCIATION

OFFICERS AND TRUSTEES

Opposite page, far right:
John R. Abel, President (r.)
Gerald D. Timmons, President-Elect (l.)

Left Column:

Jay H. Eshleman
First Vice-President

Sau Yee Chang
Second Vice-President

Howard B. Higgins
Third Vice-President

Floyd D. Ostrander
Speaker, House of Delegates

Harold Hillenbrand
Secretary

Paul H. Jeserich
Treasurer

Lon W. Morrey
Editor

Center Column:

Hubert A. McGuirl
First District

Edward F. Mimmack
Second District

Laurence L. Lathrop
Third District

Paul K. Musselman
Fourth District

William A. Garrett
Fifth District

E. Jeff Justis
Sixth District

Right Column:

Maynard K. Hine
Seventh District

Robert J. Wells
Eighth District

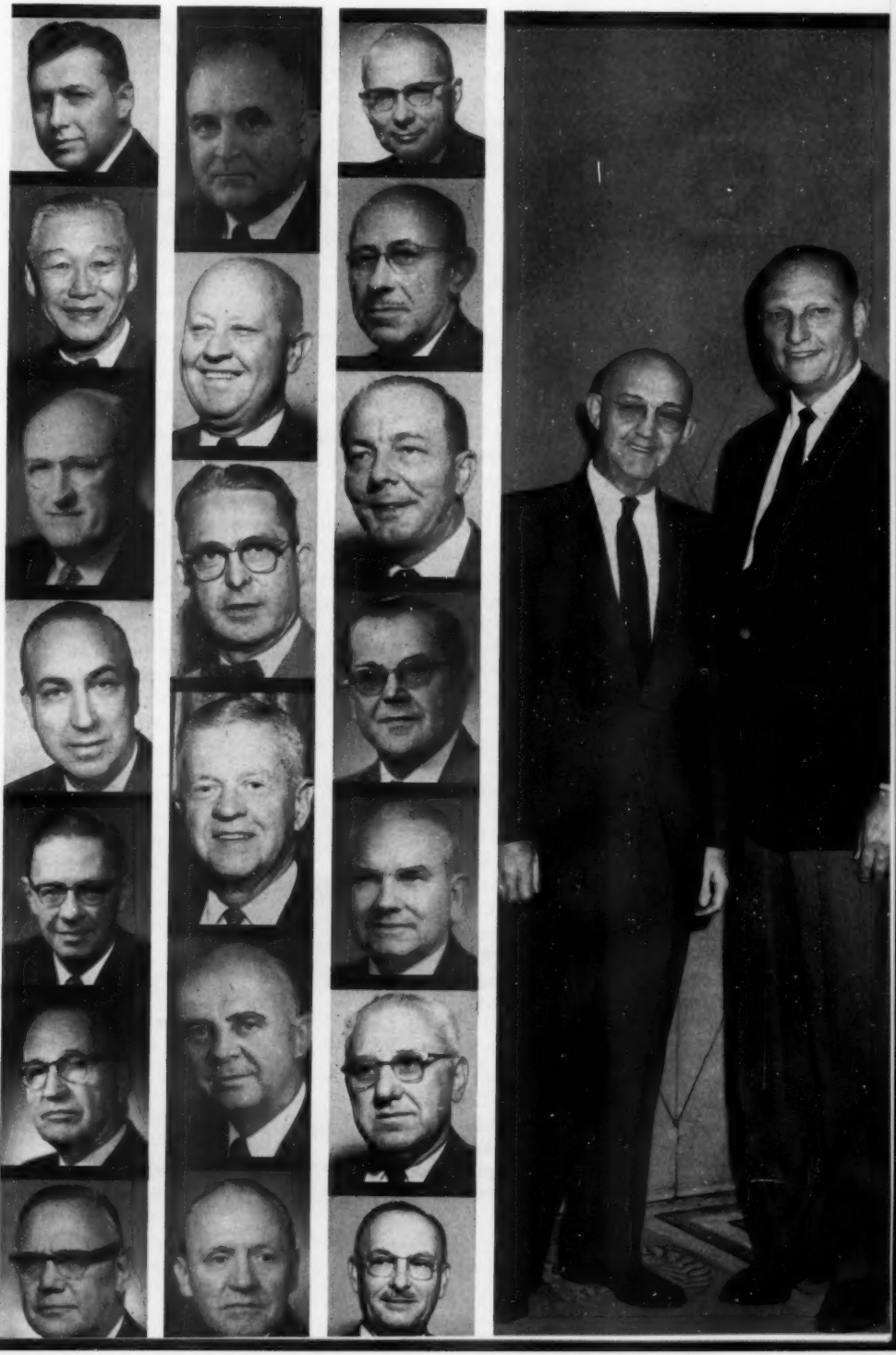
Aloyse E. Kopp
Ninth District

Henry M. Willits
Tenth District

Fritz A. Pierson
Eleventh District

John S. Eilar
Twelfth District

Roger K. Trueblood
Thirteenth District



the Fund for Dental Education, directing that $150,000 be used to establish a student loan fund and that the remainder go to the general fund with the stipulation that half of it be allocated to the program of the American Association of Dental Schools.

COUNCIL APPOINTMENTS

The following appointments to the various Councils were approved by the House of Delegates: Council on Constitution and Bylaws—H. Arthur Zappe, Texas, 1964; Council on Dental Education—Lester W. Burket, Pennsylvania, 1962, American Association of Dental Schools; J. L. Champagne, Michigan, 1964, American Association of Dental Examiners; Harold J. Noyes, Oregon, 1964, American Association of Dental Schools; R. Quentin Royer, Minnesota, 1964, American Dental Association; Council on Dental Health—Edward B. Gernert, Kentucky, 1964; Harold M. Kramer, Oregon, 1964; Howard F. Lyboldt, New York, 1964; Council on Dental Research—W. Arthur George, Pennsylvania, 1964; Council on Dental Therapeutics—James R. Hayward, Michigan, 1964; Harold J. Holt, Southern California, 1964; J. Henry Kaiser, Ohio, 1964; Council on Dental Trade and Laboratory Relations—George H. Fitz, Illinois, 1964; Council on Federal Dental Services—Henry A. Swanson, District of Columbia, 1964; Council on Hospital Dental Service—C. O. Fergusson, North Dakota, 1964; Council on Insurance—H. M. Flickinger, Arkansas, 1964; Council on International Relations—Fred A. Peterson, Colorado, 1964; Council on Journalism—Walter C. McBride, Michigan, 1964; Judicial Council—Semon Eisenberg, Georgia, 1964; Council on Legislation—Alfred E. Smith, Louisiana, 1964; Council of National Board of Dental Examiners—Taylor T. Hicks, Arizona, 1964, American Dental Association; Ralph L. Ireland, Nebraska, 1964, American Association of Dental Schools; William L. McCarty, Alabama, 1964, American Association of Dental Examiners; Council on Relief—Thomas R. Abbott, Wisconsin, 1964; Council on Scientific Session, Clarence Cottrill, West Virginia, 1964.

Mario Martinez, secretary of the Cuban Dental Association in Exile, addressed the House and recommended several actions the Association could take to aid the Cuban dentists in exile. Speaker Timmons replied that the Board of Trustees would consider his suggestions.

HONORARY MEMBERSHIPS

Honorary memberships were awarded by the House to Rep. Walter H. Judd (R.-Minn.), F. J. McClure, chief of the Laboratory of Oral and Biological Chemistry, National Institute of Dental Research, and Mr. Henry M. Thornton, president of the American Dental Trade Association.

Congressman Judd, a physician, served as a medical missionary in China from 1926 to 1940. He has been a member of the U.S. House of Representatives since 1942, representing the Fifth District of Minnesota. He has served twice as congressional representative to the World Health Assembly. Congressman Judd delivered the principal address at the Opening Meeting of the House.

Walter H. Judd

Dr. McClure was one of the pioneers in the investigative work on the relation

of fluorine to dental fluorosis and dental caries. His studies aided in establishing the safety and efficacy of the fluoridation process.

F. J. McClure

Mr. Thornton became president of the Dentists' Supply Company of New York in 1955. He is a director of the Fund for Dental Education. With his assistance, the American Dental Trade Association contributed $125,000 to the Fund in 1960—the largest contribution received to date from any source.

Henry M. Thornton

The House also granted life membership to 887 members of constituent societies and federal dental services.

EXHIBIT WINNERS

Winners of Certificates of Honor in the scientific exhibit at Convention Hall were as follows: Treatment of office emergencies, U.S. Army Dental Corps; cooperative study of oral exfoliative cytology, Veterans Administration Dental Service; the Air Force dentist in disaster control, U.S. Air Force; treatment of the oral-facial handicapped, Lancaster Cleft Palate Clinic; practical preventive dentistry, Indiana University; current developments in dental roentgenology, Temple University School of Dentistry, William J. Updegrave, Philadelphia; improved results in treatment of oral carcinoma through use of precision therapy with custom made cones, S. Gordon Castigliano and C. Jules Rominger, Philadelphia; habilitation of the cleft palate individual with the aid of prosthetic restorations, William R. Harkins, Osceola Mills, Pa., and John F. Harkins, Wesleyville, Pa.; and the use of chrome steel in dentistry for children, William P. Humphrey, Denver.

Winners in the student dental clinic program were as follows: Category 1, clinical application technic—Edward M. Ras, Frank Mellana and Joseph Pianpiano, Columbia University, first place; David L. Turpin, State University of Iowa, second place; Donald J. Aronson, University of Texas, third place; Category 2, basic science and research—Duane F. Carbone, Harvard School of Dental Medicine, first place; William J. Logothetis, Jr., and Harold E. Pierce, Jr., University of Alabama, second place; and Frank E. Weber, University of Louisville, third place.

Ann Elizabeth Stuart of Camp Hill, Pa., and Barbara E. Parker of Detroit, whose dental science projects had received the Association's Certificates of Superior Achievement during the National Science Fair, attended the annual session as guests of the Association. Their projects were shown in Convention Hall.

Attendance at the annual session totaled 16,701, of whom 8,123 were dentists (including 248 dentists from abroad). The Association will hold its 103rd annual session October 29-November 1, 1962, in Miami Beach, Fla.

BOARD ACTIONS

The new Board of Trustees met immediately after the close of the final session

The American Dental Association's Board of Trustees, officers and staff members meet prior to the 102nd annual session at the Sheraton Hotel in Philadelphia. Left to right: (Standing) John S. Eilar, Twelfth District; Aloyse E. Kopp, Ninth District; C. Willard Camalier, assistant secretary; Roger K. Trueblood, Thirteenth District; Clarence S. Renouard, third vice-president; Robert J. Wells, Eighth District; John B. Wilson, first vice-president; William A. Garrett, Fifth District; C. Gordon Watson, assistant secretary; Maynard K. Hine, Seventh District; H. B. Washburn, treasurer; Gerald D.

of the House of Delegates. The Board:

Approved the following dates for one special and three regular sessions of the Board of Trustees in 1962: Special session, January 18-21; spring session, March 15-17; summer session, August 23-25; annual session, October 24-27;

Confirmed the designation of Obed H. Moen, Wisconsin, as the national treasurer of the Fédération Dentaire International for the United States for the term ending with the 1962 annual session;

Named Alfred E. Smith, Louisiana, as the representative on the policy-making body of the American Thrift Assembly for the term ending with the 1962 session;

Designated President John R. Abel, Secretary Harold Hillenbrand and Assistant Secretary Bernard J. Conway as representatives to the Joint Council to Improve the Health Care of the Aged for terms ending with the 1962 session;

Appointed Fred A. Henny, Michigan; O. J. McCormack, New York, and John E. Fauber, Veterans Administration, as the Association's members of the Liaison Committee to the Joint Commission on Accreditation of Hospitals for terms ending with the 1962 session;

Named Jay H. Eshleman, Pennsylvania; Howard F. Lyboldt, New York, and Assistant Secretary Carl L. Sebelius, as delegates to the National Health Council for terms ending with the 1962 session;

Awarded a three-year contract for the printing of the JOURNAL OF ORAL SURGERY, ANESTHESIA AND HOSPITAL DENTAL SERVICE to the General Printing Company, which has been printing the publication since its inception in 1943;

Awarded a three-year contract for the printing of DENTAL ABSTRACTS to R. R. Donnelley and Sons, which has been printing the publication since its inception in 1956;

Designated the following to serve as chairmen of their respective Councils: Frank W. Jordan, Kentucky, Constitution and Bylaws; Raymond J. Nagle, New York, Dental Education; R. W. Open-

Timmons, speaker, House of Delegates; J. Roy Doty, assistant secretary; Donald H. Rowcliffe, business manager; Bernard J. Conway, assistant secretary; E. Jeff Justis, Sixth District; Laurence Lathrop, Third District. (Seated) Russell I. Todd, second vice-president; Edward F. Mimmack, Second District; John R. Abel, president-elect; Charles H. Patton, president; Harold Hillenbrand, secretary; Arthur W. Easton, First District; Henry M. Willits, Tenth District; Paul K. Musselman, Fourth District; and Fritz A. Pierson, Eleventh District.

shaw, California, Dental Health; R. L. Kreiner, Illinois, Dental Research; Frank J. Orland, Illinois, Dental Therapeutics; J. Eugene Ziegler, Southern California, Dental Trade and Laboratory Relations; David W. Matteson, Oklahoma, Federal Dental Services; O. J. McCormack, New York, Hospital Dental Service; Harold M. Flickinger, Arkansas, Insurance; John W. Knutson, Southern California, International Relations; Isaac Sissman, Pennsylvania, Journalism; C. E. Rutledge, California, Judicial; Matthew Besdine, New York, Legislation; Alva S. Appleby, Maine, National Board of Dental Examiners; Paul H. Bowden, Montana, Relief; and J. Malcolm Elson, Illinois, Scientific Session;

Appointed Fritz A. Pierson, Nebraska; John S. Eilar, New Mexico, and Edward F. Mimmack, New York, as members of the Special Committee on Student Loan Fund to develop the Memorandum of Agreement between the Association and the Fund for Dental Education for the operation and administration of the student loan fund from the Association;

Noted that the President had named to a special committee to aid in the development of the inter-American aspects of the 1962 annual session: William A. Garrett, Georgia; Edward F. Mimmack, New York; Gerald D. Timmons, Pennsylvania; Roger K. Trueblood, Arizona;

Designated Edward F. Mimmack, New York; William A. Garrett, Georgia, and Maynard K. Hine, Indianapolis, as members of the Special Committee on the Women's Auxiliary;

Appointed Lon W. Morrey as editor for one year ending December 31, 1962, and Paul H. Jeserich as treasurer for three years ending December 31, 1964. The Secretary, Harold Hillenbrand, was appointed for a three-year term in 1959.

The Board also expressed appreciation to former president H. B. Washburn who, after serving as treasurer of the Association since 1948, retired at the close of the 102nd annual session.

Association Affairs

CIVIL DEFENSE PLANS FOR DENTISTS AND PUBLIC AIRED

In the event of nuclear attack, dentists must be prepared to serve on medical casualty teams, Lt. Col. James F. Parker, of the U.S. Army Dental Corps, said October 14. Addressing the Third National Dental Civil Defense Conference in Philadelphia, Col. Parker said that dentists should prepare themselves to serve, in a postattack period, in the provision of emergency medical care, treatment of shock, relief of pain, treatment of radiation sickness and burns, emergency psychotherapy, sanitation and prevention medicine.

The number of physicians in the United States would be hopelessly inadequate to care for the millions of casualties that would result from nuclear attack, said Col. Parker, "without the help of additional members of the national health team."

Thomas F. Powers, chairman of the Association's Council on Federal Dental Services, presided at the meeting. Speakers included Robert Strausz-Hupé, director of the Foreign Policy Research Institute, University of Pennsylvania; James K. Shafer, director of health services, Office of Emergency Planning; and Mr. Jerrold M. Michael, assistant chief, Division of Health Mobilization, U.S. Public Health Service. John R. Abel, speaking as president-elect of the American Dental Association, welcomed the conference.

"Civil defense is an integral part of nuclear strategy," said Dr. Strausz-Hupé. ". . . Without defense of the homeland, nuclear strategy is not credible. Civil defense work is as important as the shaping of nuclear warheads. We can win a nuclear war. We will suffer very heavy losses, but enough people will survive to rebuild our prosperity and culture."

Dr. Shafer congratulated the Council on Federal Dental Services for sponsoring its annual civil defense conferences. He said the American people found it difficult to grasp the difference between conventional weapons and thermonuclear assault. Nineteen hundred 200-bed emergency hospitals have been stockpiled by the federal government and another 286 similar hospitals by the various states, but 7,500 such hospitals were needed, he said.

A number of dental schools now include in their curriculums emergency health service and disaster medicine, said Dr. Shafer. Such subjects must be taught by all health service schools, he added. Most dental and medical schools in the United States are in nuclear target areas, added the speaker, and urged that all dental schools make plans to continue to provide training in a postattack situation.

Mr. Michael said that training kits for a medical self-help training program were ready for distribution. The program is designed for laymen to teach laymen how to survive a nuclear bomb attack. Each 22-pound kit contains 12 two-hour lessons on survival, six film strips, a projector and screen, and examination booklets.

DENTAL EDUCATION COUNCIL APPROVES SCHOOLS, HOSPITALS

The Council on Dental Education, during its meeting, September 6-8, in Chicago, reviewed several schools for reaccreditation. After hearing reports on four accredited dental schools that had been revisited, the Council approved them for reaccreditation. These schools of dentistry are at Loma Linda University, Indiana University, the University of Pittsburgh, and the College of Physicians and Surgeons (provisional).

The Council also approved for accreditation four dental hygiene schools, three which had been revisited and one which was a new program. They are: Curriculum for dental hygienists, Indiana University School of Dentistry; curriculum in dental hygiene, University of Michigan School of Dentistry; program for den-

tal hygienists, University of Minnesota School of Dentistry (provisional), and department of hygiene, Loma Linda University School of Dentistry (new program).

One new school for dental laboratory technicians at the City College of San Francisco was approved for accreditation by the Council.

The Council also approved ten dental internships and residencies. These programs are offered by the following hospitals: Ireland Army Hospital, Fort Knox, Ky., rotating internship; John Gaston City Hospital, Memphis, Tenn., oral surgery residency (24 months); M. D. Anderson Hospital and Tumor Institute, Houston, prosthodontic residency 12 months; Veterans Administration Hospital, Richmond, Va., rotating internship; Veterans Administration Hospital, Washington, D. C., rotating internship; Veterans Administration Hospital, Oakland, Calif., rotating internship; U.S. Army Training Center, Infantry, Fort Dix, N.J., rotating internship; St. Elizabeth Hospital, Youngstown, Ohio, oral surgery internship; Children's Orthopedic Hospital, Seattle, Wash., pedodontic internship, and Veterans Administration Hospital, Dearborn, Mich., rotating internship (provisional).

Inquiries concerning dental internships and residency appointments should be directed to the Chief of Dental Service at these hospitals. A complete listing of approved schools, dental internships and residencies may be obtained from the Council on Dental Education, 222 E. Superior St., Chicago 11.

PRACTICE LOCATION PAMPHLET AND OTHERS NOW AVAILABLE

The Bureau of Economic Research and Statistics has issued 1961 editions of the following pamphlets: *Distribution of Dentists in the United States by State, Region, District and County,* and *Facts About States for the Dentist Seeking a Location.*

The Bureau also has issued two Mimeographed reports on the distribution of orthodontists and oral surgeons by district, region and state in 1960. The reports show that many districts with populations in excess of 100,000 are without orthodontists and oral surgeons.

Single copies of the pamphlets and reports may be obtained free on request to the Bureau at the Central Office, 222 E. Superior St., Chicago 11.

JOHN STANFORD, RESEARCH ASSOCIATE, RECEIVES Ph.D.

John W. Stanford, research associate for the American Dental Association at the National Bureau of Standards since 1952, has received a Ph.D. degree in dental materials from Georgetown University.

John W. Stanford

The title of his thesis was "Studies of dental calculus: organic portion." Dr. Stanford graduated from the University of Maryland cum laude in 1952 and earned an M.S. degree from Georgetown University in 1956.

HILLENBRAND NAMED HONORARY MEMBER OF HOSPITAL GROUP

Harold Hillenbrand, secretary of the American Dental Association, was named an honorary member of the American Hospital Association during the group's annual meeting in Atlantic City, September 27. Dr. Hillenbrand received the

Staff members Ewart Ramsden (l.), Miss Francis Collis and William Barkow in session headquarters.

Mrs. Charles H. Patton (l.) and Mrs. John R. Abel relax in the Pattons' suite at the Sheraton Hotel in front of a mahogany, 1750 Chippendale highboy.

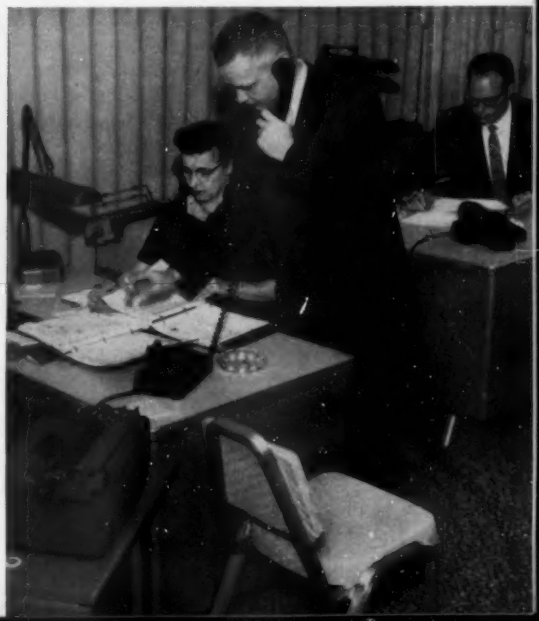
The past presidents of the Association meet for lunch during the session. Seated, from the left: H. B. Washburn, LeRoy M. Ennis, Clyde E. Minges, J. Ben Robinson, C. R. Wells. Standing: Paul H. Jeserich, B. C. Kingsbury, L. M. FitzGerald, P. E. Adams, LeRoy M. S. Miner, O. W. Brandhorst, Percy T. Phillips, C. Willard Camalier, William Alstadt and O. A. Oliver.

Past President Paul H. Jeserich pins a past-president pin on President Charles H. Patton.

An overflow crowd attends the reference committee hearings at which the reports of the councils on dental research and dental therapeutics were discussed. George D. Dore, Jr., of Seattle, Wash., (at lectern) served as chairman.

Enjoying the President's Banquet are President and Mrs. Charles H. Patton (l.) and President-Elect and Mrs. John R. Abel.

Staff members Miss Ruth Wade, Robert Newport (c.) and Herbert Lassiter working in headquarters office at the Sheraton Hotel.



honor in recognition of his outstanding contributions to the health and hospital field.

Others who also received honorary membership were: Mr. Ralph W. Burger, chairman of the board, Great Atlantic and Pacific Tea Company, and president, Hartford Foundation, Inc.; Mr. Dean Conley, executive director, American College of Hospital Administrators; Jack R. Ewalt, M.D., director, Joint Commission on Mental Illness and Health, and superintendent, Massachusetts Mental Health Center; Miss Doris Gleason, R.R.L., executive director, American Association of Medical Record Librarians; George Edward Godber, C.B., chief medical officer, British Ministry of Health, and Luther L. Terry, M.D., Surgeon General, U.S. Public Health Service.

Dental Societies

TIDEWATER DENTAL SOCIETY FITS 1,500 MOUTH PROTECTORS

In a campaign to provide mouthguards for local high school football players, the Tidewater Dental Association in Hampton Roads, Va., made models of over 1,500 players' mouths. The dental society was able to achieve its record number of models in a few weeks' time by using the 18 participating schools as central meeting places at which to take impressions, by utilizing groups of dentists at a time and by using mass production principles. Impressions were taken at different high schools on successive Saturday afternoons.

Although the local program has been in effect since 1955, this year efforts were intensified. The general opinion of the school coaches participating in the program has been that mouthguards reduced mouth injuries by at least 90 per cent in the first year. One school reported that during the last five years only one serious mouth injury occurred as compared to an average of 10 to 15 per season in previous years.

The dental society was able to provide the mouthguards at no cost to the individual student through the cooperation of the local laboratories and supply houses and by teaching the coaches the technic of fabricating the guards.

KANSAS PROMOTES DENTISTRY WITH CENTENNIAL THEME

The Kansas State Dental Association, the Seventh District Dental Society, and the dentists of Hutchinson and Wichita, Kans., this summer developed two dental health exhibits using as a theme this year's celebration of Kansas' Centennial.

An exhibit on a century of progress in dentistry was set up at the exhibition hall in the Frontier Village on the outskirts of Wichita. It featured dental chairs, x-ray machines and other equipment of today and contrasted them with what was available 100 years ago. Assistants also were at the exhibit in "then" and "now" uniforms.

A slide projector with before-and-after slides were used as educational media for the more than 500 persons who were attracted to the exhibit by the striking contrast in equipment.

A similar display was placed at the Kansas State Fair in Hutchinson, September 18-22.

SEATTLE FOLDER INFORMS NEW MEMBERS OF MANY BENEFITS

The Seattle District Dental Society has prepared a folder containing basic information about membership which it gives to all new members and to the senior class of the University of Washington School of Dentistry. The main purpose of the folder is to aid in the transition from a student to a licensed practitioner, informing him of the many tangible benefits to be derived by becoming a member of the local, state and national society.

The folder contains information on the various types of insurance available to

George D. Dore, Jr. (second from left), president of the Washington State Dental Association, receives the Grand Award from Mr. J. Harold Bailey, president of the American Society of Association Executives. Also shown are Calvin C. Christensen (r.), president of the Washington Dental Service, and Mr. Robert E. Paulsen, chief administrator for the dental association and the service program.

members, a list of programs and study clubs held by the society, a copy of the society's bylaws, a copy of the American Dental Association's *Principles of Ethics,* information on a credit bureau available to members, and other information.

New members are presented with the information folder at an indoctrination meeting, which is a prerequisite to becoming a member. At this time, an oral explanation is given of all the material contained within the folder by the chairmen or representatives of the various committees.

Further information may be obtained on the folder from J. Harvey Losh, secretary of the society, 1800 Medical-Dental Building, Seattle 1.

WASHINGTON STATE SOCIETY RECEIVES NATIONAL AWARD

The Washington State Dental Association received the Grand Award of the American Society of Association Executives "for having achieved the best program developing public understanding of the role of a voluntary association in our economy." The presentation was made at the society's national meeting in Denver, September 4.

The award was for the formation of the Washington Dental Service, which the citation described as a stimulus to greater public respect for the profession, improved dental technics, and a deterrent to socialized medicine.

Miss Ruth H. Hart, executive secretary of the Los Angeles County Dental Society, also was honored by the American Society of Association Executives for being the outstanding executive of the year in the category of local or metropolitan associations. Miss Hart has been with the dental society for 20 years.

CLEVELAND DENTAL SOCIETY 75 YEARS OLD IN DECEMBER

The Cleveland Dental Society will celebrate its seventy-fifth anniversary December 4, 1961, at the Carter Hotel in Cleveland. A Diamond Jubilee program has been planned featuring Gerald D. Timmons, dean of the Temple University School of Dentistry, as the dinner speaker. After the dinner there will be dancing and entertainment.

National Defense

MILITARY SURGEONS MEETING TO HAVE DENTAL SECTION

A dental section will meet during the annual meeting of the Association of Military Surgeons, November 6-8, at the

Cutting a cake commemorating the forty-ninth anniversary of the founding of the U.S. Navy Dental Corps are Mrs. J. R. Wible, president of the Hawaii Dental Officers' Wives Club, and Capt. B. H. Faubion (DC), USN, the Pacific Fleet Dental Officer.

Mayflower Hotel in Washington, D. C. The theme of the meeting is international medicine—path to world progress. Essays to be presented at the dental section, which will meet the morning of November 7, include: the role of federal dental services in international health and understanding, Walter J. Reuter; the federal dentist: his role in Japanese dentistry, George C. Paffenbarger; nutrition and dentistry in Taiwan and Formosa, George W. Burnett; dental program in Brazil, John M. Franke, and soil minerals and dental decay in New Zealand school children, F. L. Losee.

Retirement point credit will be given to reserve officers attending the meeting. There is no registration fee.

NAVY DENTAL OFFICERS HOLD BIRTHDAY PARTY IN HAWAII

Over 150 dental officers on duty in Hawaii celebrated the forty-ninth anniversary of the founding of the U.S. Navy Dental Corps, at a party August 26, at Pearl Harbor. Their wives and other guests also attended.

The celebration included a dinner, dancing and a movie entitled "The Navy Dental Corps" which depicts the experiences of a young dental officer and his wife starting their career in the Navy.

DENTIST DRAFT ORDERED; 154 TO BE INDUCTED SOON

The Defense Department October 3 ordered the drafting of 154 dentists, 495 physicians and 67 veterinarians for the military services. The special call to Selective Service headquarters for health personnel was necessary to meet the requirements of the current military build-up requested by the President and authorized by Congress.

Dentists and veterinarians that will be called up will serve in the Army; the physicians in the Army, Navy and Air Force.

Local selective service boards have been asked to review classifications of all

dentists, physicians and veterinarians born on or after January 1, 1933, as the first step in the build-up.

This is the second time this year that the Defense Department has ordered a physician draft. On June 9 it issued a call for 185 physicians for the Navy and Air Force because of a lack of volunteers. A dentist draft at that time was unnecessary because of successful voluntary recruitment. Before this June, no physicians had been drafted since 1957, no dentists since 1955, and no veterinarians since 1952.

NAVY ISSUES STATEMENT ON DENTAL CARE FOR DEPENDENTS

The U.S. Department of the Navy recently released a statement on dental care for dependents. A summary of this statement follows:

With the passage of the Dependent's Medical Care Act, the dependents of naval personnel residing either outside the United States or in areas within the United States that have been designated "remote" will be given routine dental care by the Navy Dental Corps. In addition, many dependents residing within the United States will be provided with dental care to relieve pain and suffering or as an adjunct to medical and surgical treatment when such care is deemed necessary by the cognizant dentist and physician.

An area must be more than 30 miles from a community with adequate civilian facilities to be considered remote. Unusual geographic and transportation factors which might unreasonably increase the time and expense of travel will also be considered.

In each of the past two years approximately 110,000 dependent patients were treated. Slightly less than a half-million procedures were performed each year for these patients.

To implement the new Dependents' Medical Care Act, the number of dental officers is being increased in areas where dependents are eligible to receive dental care. The Dental Corps' preventive dentistry program has been altered to include those technics and educational programs that are directed at children, and increased attention has been given those programs involving fluorides, both fluoridation of water supplies and topical application. The research program of the Navy Dental Corps also has been altered to take into consideration the dental problems of dependents incidental to living in a military atmosphere.

Public Health

ARKANSAS WELFARE PATIENTS TO RECEIVE DENTAL CARE

Limited dental care will now be available to welfare recipients in Arkansas as a result of the combined efforts of the Arkansas State Legislature, the Arkansas Department of Public Welfare and the Arkansas State Dental Association. Services will be limited basically to the relief of pain, emergency extractions and palliative treatment. For children, provisions have been made for limited restorations and orthodontic treatment. The welfare patient must be certified by the Welfare Department to the dentist of his choice.

IOWA SUPREME COURT UPHOLDS RIGHT TO FLUORIDATE WATER

The Iowa Supreme Court, September 19, reversed the decision of a lower court and held that the City Council of Council Bluffs did have the power to order fluoridation of the public water supply. The lower court had granted a permanent injunction to a group of four Council Bluffs' citizens headed by a chiropractor.

The higher court ruled that the decision by the city council to add fluoride to the water was a health measure and that the matter of public health was a proper subject of police power.

Charles H. Henshaw, dental director

of the state of Iowa, has reported that fluoridation also has started in West Des Moines and in Boone. With this decision of the supreme court, several more Iowa communities probably will install fluoridation equipment. There are now 36 installations serving 44 Iowa cities and towns with a total population of 771,538.

KANSAS CITY COUNCIL VOTES TO FLUORIDATE WATER SUPPLY

The city council of Kansas City, Missouri, September 3, voted to add fluoride to the city water supply. By a 6-3 vote, the council adopted a resolution authorizing the negotiation of a contract to spend $65,000 for the first steps in the fluoridation process.

One councilman said he voted for fluoridation because of the overwhelming medical and dental evidence that its effects promote dental health and that it is not harmful.

Twice, since the ordinance was introduced in June, more than 300 persons packed the city council chambers to present their arguments for and against the proposal.

Dental Education

QUINN SUCCEEDS LYNCH AS DENTAL DEAN AT CREIGHTON

Galen W. Quinn, formerly associate professor of orthodontics at Duke University, has been named dean of the Creighton University School of Dentistry succeeding Benjamin Lynch, who has retired to spend more time in private practice.

Dr. Quinn graduated from Creighton's dental school in 1952 and practiced at Belle Fourche, S.D., before obtaining a Master's degree in orthodontics at the University of Tennessee in 1955.

From 1955 to 1958 he headed the department of pedodontics at the University of Tennessee and directed the postgraduate program in pedodontics. During the last three years at Duke, Dr. Quinn concentrated on treatment of facial abnormalities, cleft palate and related problems. He is editor of the *Cleft Palate Bulletin* and a member of the American Association of Orthodontics, American Society of Dentistry for Children, American Association for Cleft Palate Rehabilitation, American Association for Advancement of Science and the American Association for University Professors.

Dr. Lynch had been dean of Creighton's dental school since 1954 and will remain as head of the department of oral surgery.

WHO FELLOWSHIPS AVAILABLE TO U.S. HEALTH WORKERS

A limited number of short-term fellowships, for the "improvement and expansion of health services" in the United States, will be provided in 1962 by the World Health Organization to United States citizens. All applications will be screened by a WHO fellowship selection committee established by the Surgeon General.

Applicants must be engaged in full-time public health or educational work. In making selections, the committee will consider the ability of the individual, the field of study proposed and the contribution which foreign study will make on his return. Officers and employees of the U.S. government are not eligible.

These fellowships will cover per diem, transportation and, except in very unusual circumstances, will be limited to short-term travel, from two to four months. Employers of successful applicants will be expected to endorse applications and to continue salary during the fellowship.

Fellowships will be awarded up to the total funds available and will probably not start until May 1, 1962. The deadline for the receipt of applications is January 1, 1962. Further information and application forms may be obtained from

Howard M. Kline, secretary, WHO Fellowship Selection Committee, Public Health Service, Washington 25, D.C.

CASUALTY TREATMENT COURSES SET FOR DECEMBER, APRIL

Two spaces have been reserved for civilian members of the American Dental Association to attend the casualty treatment training courses to be presented by the Navy Dental Corps at the U.S. Naval Training Center, San Diego, Calif., on December 4-8, and at the U.S. Naval Dental School, Bethesda, Md., on April 2-6, 1962. Members wishing to register for either of these courses should contact the secretary of the Council on Federal Dental Services at the Association's Central Office.

LUXENE, INC., SETS UP GRANT FOR LABORATORY TECHNICIANS

Luxene, Inc., has created a scholarship fund for the training of dental laboratory technicians in approved schools. The company will give $4,500 to the Fund for Dental Education for this purpose and will supplement it annually with $1,000. The scholarship will be known as the Luxene and Luxene Processing Laboratories Scholarship Fund. Applicants for the scholarship will be recommended by the company or by a Luxene processing laboratory.

STANLEY D. TYLMAN RETIRES AFTER TEACHING 41 YEARS

Stanley D. Tylman retired September 1 after 41 consecutive years of teaching at the University of Illinois College of Dentistry. Dr. Tylman, head of the university's department of fixed partial prosthodontics, joined the school's faculty in 1920, two years after his graduation from Northwestern University Dental School.

He is past-president of the Chicago Dental Society and the American Academy of Plastics Research. He is editor-in-chief of the *Yearbook of Dentistry* and the author of the textbook, *Crown and Bridge Prosthesis.*

While instructing at the University of Illinois, Dr. Tylman worked toward a bachelor's degree in metallurgy, which he received from the Illinois Institute of Technology in 1927. He also received a master's degree in pathology from Northwestern University in 1930. He plans to complete work on a doctor of philosophy degree in the field of physical chemistry after his retirement.

MANY POSTGRADUATE COURSES LISTED FOR COMING YEAR

California • The University of California Dental Extension is offering the following courses: Oral diagnostic procedures, November 10-12, E. Cheraskin; intraoral precision drilling technic, November 19, Lloyd Baum; work simplification procedures throughout the dental office, November 22, 29 and December 6, A. Frank Eyer; etiology, pathology and treatment of periodontal disease, November 24-26, Sigurd Ramfjord; and partial denture prosthesis, December 2, 3, 9, 10, Clawson Skinner. Further information may be obtained from J. Eugene Ziegler, head, dental extension, Room 211, 815 S. Hill St., Los Angeles 14.

Detroit • The Detroit District Dental Society will present a course in prosthodontics, November 18-19, by Leo Talkov. The fee is $35 for society members and $43 for nonmembers, including luncheon. Further information may be obtained from the society at 4421 Woodward Ave., Detroit 1.

Georgetown • Georgetown University School of Dentistry is offering a course, new concepts of retention—parallel pins, November 17-19, by Gerard L. Courtade and Carl Sanell. Further information may be obtained from the school, Washington 7, D. C.

Physicians and Surgeons • The following postgraduate courses are being offered by the College of Physicians and Surgeons of San Francisco School of Dentistry: Operative dentistry under general anesthesia, November 6-7, January 8-9, and March 12-13, John J. Tocchini, Emmett M. Stanton, Jr.; oral roentgenology for dentists, November 9-10, James

A. Campbell: clinical periodontics, December 14-16, Alvin C. Hileman and B. O. A. Thomas; oral roentgenology for assistants, December 21-22, February 15-16, and May 3-4, James A. Campbell; dentistry for children, January 21-26 and April 15-20, Charles A. Sweet; tooth guidance, January 28-February 1, I. Irwin Beechen, George N. Boone and F. B. Rudine; dental materials, their use and abuse, March 3-4, George M. Hollenback and John E. Rhoads; and endodontics, May 21-23, Bertram L. Wolfsohn. Further information may be obtained from Charles A. Scrivener, associate dean of the school, 344 Fourteenth St., San Francisco 3.

Public Health Service • The Public Health Service, through its Division of Radiological Health, will give a two-week training course in basic radiological health, at the Southeastern Radiological Health Laboratory, Montgomery, Ala., December 4-5. The course will be repeated in Cincinnati, April 23-May 4; Las Vegas, February 26-March 9, and Rockville, Md., May 7-8. Further information may be obtained from the chief of the training program, Robert A. Taft Sanitary Engineering Center, 4676 Columbia Parkway, Cincinnati 26.

Walter Reed Army Medical Center • The dentistry division of the Institute of Research at the center is offering the following postgraduate courses: Preventive dentistry, November 6-10, 20 lecturers including Joseph L. Bernier, Surindar N. Bhaskar, Irving Glickman, Robert B. Shira, and Russell W. Sumnicht; and prosthodontics, December 4-8, Edmund S. Olsen, Jr., Luzerne G. Jordan, and Arthur R. Frechette. Further information may be obtained from Col. George H. Timke, Jr., director of the division, Walter Reed Army Medical Center, Washington 12, D. C.

General

RUSSIAN-SPEAKING DENTIST SOUGHT FOR MEDICAL MISSION

A Russian-speaking American dentist is being sought to participate in a medical mission which will tour three major cities of the Soviet Union during February-June, 1962. Inquiries regarding the mission should be sent to Mr. John Dixon, ICS Exhibits Division, U.S. Information Agency, Washington 25, D.C.

ENDODONTISTS TO DISCUSS APICAL, PERIAPICAL TISSUES

The American Association of Endodontists will meet February 11-14 at the Fountainbleau Hotel in Miami Beach, Fla. The theme of the meeting will be the biology of the apical and periapical tissues. Clinicians will be S. N. Bhaskar, Harry Blechman, D. Walter Cohen, Paul Goldhaber, Daniel Laskin, Maury Massler, Harry Sicher, and C. E. Wilde, Jr. The meeting is open to all members of dental and allied professions. Further information may be obtained from Robert A. Uchin, Suite 326, Bayview Building, 1040 Bayview Drive, Fort Lauderdale, Fla.

COLUMBIA ALUMNI DINNER IN NEW YORK, NOVEMBER 16

The thirty-third annual reunion dinner of the Association of Dental Alumni of Columbia University will be held at 6:30 p.m., November 16 at the Hotel Roosevelt in New York City. Cocktails will precede the dinner. Certificates will be awarded to members of the 25 and 50 year classes. All alumni are invited. Guests are welcome and dress is informal. Tickets are $8.50 per person and checks should be made payable to the Association of Dental Alumni of Columbia University and sent to Harold P. Cobin, chairman, 30 E. 60 St., New York 22.

CALIFORNIA BANK OFFERS EMPLOYEE DENTAL CARE PLAN

The Mechanics Bank of Richmond, Calif., on July 1 installed a group dental care plan underwritten by the California Dental Association Service. The program will cover employees in the various offices of the Mechanics Bank in Contra Costa and Alameda counties. About 700 dentists, participating in the California Dental Association Service and members of the Contra Costa and Alameda county dental societies, will cooperate in putting

the plan into effect. The plan gives the patient the choice of dentist. Coverage includes a large scope of dental restoration and maintenance with such specific items as prophylaxis, antibiotic treatments, oral surgery and endodontics as well as other important phases of dental care.

LLOYD DODD, FORMER ILLINOIS SOCIETY PRESIDENT, DIES

Lloyd H. Dodd, 67, former president of the Illinois State Dental Society and of the Decatur District Dental Society, died September 24 in Decatur, Ill. Dr. Dodd graduated from St. Louis University in 1915 and had practiced dentistry in Hume, Newman, and Decatur, Ill. He was a former member of the American Dental Association's Council on Dental Health and in 1950 he served as chairman of the Association's practice management section. He was a Fellow of the American College of Dentists and the International College of Dentists. His survivors include his wife and one brother.

MORRIS BIDERMAN NAMED TO GOVERNOR'S DEFENSE COUNCIL

Morris L. Biderman of Providence, R.I., has been appointed to Governor John A. Notte's Council on Defense for Rhode Island. This council has 12 members including one physician and one dentist. Dr. Biderman is also chairman of the Rhode Island State Dental Society's Committee on Military Affairs.

HARLAN HORNER HONORED AT FRATERNITY REUNION DINNER

Harlan H. Horner, former secretary of the American Dental Association's Council on Dental Education, was honored at a testimonial dinner October 21 in Champaign, Ill. The event was held during the grand reunion of the University of Illinois chapter of Sigma Alpha Epsilon fraternity. Dr. Horner and his wife were honored for donating a collection of Lincolniana which makes up the Lincoln Room in the University Library.

EASTON AWARDED MEDAL FOR SERVICE TO HEALTH FIELD

Arthur W. Easton, former trustee from the first district of the Association, was awarded the Roselle W. Huddilston Medal for "distinguished service and outstanding contribution in the field of health to the people of the State of Maine." The presentation was made at the fiftieth anniversary meeting of the Maine Tuberculosis and Health Association at Samoset.

Arthur W. Easton

Dr. Easton's citation included the following statements: "Most notable are his efforts to permit fluoridation of Maine public water supplies and the measure to allow dental hygienists to make topical applications of sodium fluoride to exposed surfaces of teeth. . . . Dr. Easton has served the dental profession in many ways by encouraging young people to study dentistry and by promoting better dental hygiene. He aided in the development of a school of dental hygiene at Westbrook Junior College. Probably more than any other man, he is responsible for helping develop and maintain a high standard of dental practice throughout this state."

The Huddilston medal was created to recognize distinguished service in public health. This is the fifth year it has been presented.

WILLIAM N. HODGKIN DIES SEPTEMBER 7 IN VIRGINIA

William N. Hodgkin, 70, well-known dental leader and historian, died September 7 in Virginia. Dr. Hodgkin graduated from the University College of Medicine Dental School (later merged with the Medical College of Virginia) in 1912, and received an honorary Doctor of Science degree from that school in 1941.

William N. Hodgkin

He had been treasurer, secretary-treasurer and president of the Virginia State Dental Association; president of the Virginia State Board of Dental Examiners; president of the American Association of Dental Examiners; president of the Northern Virginia Dental Society; president, treasurer, regent and vice-president of the American College of Dentists, and president of the American Academy of the History of Dentistry.

Dr. Hodgkin had also served as a member of the American Dental Association's Council on Legislation and history committee, and as chairman of its Council on Dental Education. He had been a delegate to its annual convention for many years. He was a Fellow of the American Association for the Advancement of Science, a member of the dental advisory committee to national headquarters of selective service system and was an honorary member of the British Dental Association. He was also a member of the American Association of History of Medicine.

GREAT LAKES ORTHODONTISTS TO MEET IN MIAMI BEACH

The Great Lakes Society of Orthodontists will hold its thirty-second annual meeting, November 26-December 1, at the Eden Roc Hotel, Miami Beach, Fla. Further information may be obtained from the secretary, Edward A. Cheney, Medical Dental Building, 2909 Grand River, Lansing, Mich.

DENVER SITE FOR DECEMBER DENTAL GENETICS SYMPOSIUM

The Nd (dental) section of the American Association for the Advancement of Science will hold a symposium on dental genetics, December 27, at the Cosmopolitan Hotel in Denver.

Speakers and their topics will be: Carl J. Witkop, Jr., Recent advances in dental genetics; Richard H. Osborne, The respective role of twin, sibling, family and population methods on dento-medical studies; Jerome D. Niswander, Effects of heredity and environment on the development of the dentition; Robert Gorlin, Chromosomes nondisjunctions and oral anomalies; Harrison R. Hunt and Samuel Rosen, The effectiveness of selection in producing laboratory stocks genetically uniform for resistance, or susceptibility, to dental caries; Bertram Hanna, Family studies of the facial complex; Sidney L. Horowitz, Some clinical aspects of genetic research in dentistry; Stanley M. Garn and Arthur B. Lewis, Third molar polymorphism and dental genetics; and Shirley Glasstone Hughes, The regulative changes in tooth germs grown in tissue culture.

A round table discussion will be held at the conclusion of the program.

cases and comments

STABILITY OF PLASTIC IMPRESSION TRAYS

By Julian B. Woelfel, D.D.S., and George C. Paffenbarger, D.D.S., Washington, D.C.

During an evaluation of resin denture base materials by the American Dental Association Research Division at the National Bureau of Standards, an investigation was also made of the stability of plastic trays when used to carry a layer of zinc oxide-eugenol paste as the final impression. A brief résumé of the findings follows.

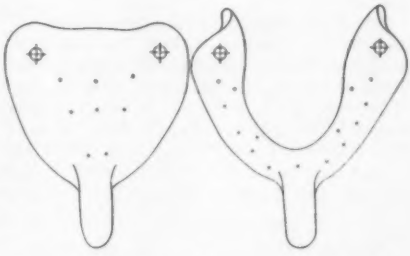
In complete denture construction it is common practice to use impression compound or an alginate impression material for the preliminary impression. From this impression a preliminary gypsum cast is obtained. Then a spacer of a suitable material such as a sheet of wax is placed over the tissue surface of the cast needing relief, and space is allowed for the final corrective impression.

Self-curing acrylic resin dough is then molded by hand over the gypsum cast with the spacer in place. This self-curing acrylic resin tray usually is modified to suit the needs of the individual patient by removing resin or by adding impression compound or both. The final impression is then made with a corrective wash. Frequently this wash is zinc oxide-eugenol paste. However, some practitioners believe that the eugenol will attack the self-curing acrylic resin sufficiently to release strain and cause the tray to warp.

To ascertain whether this belief was correct the following experiment was conducted on impression trays of self-curing acrylic resin: Stainless steel pins with reference lines were placed in one upper and two lower impression trays on the tongue side about where the second molars would be as shown in the illustration. These pins were cemented into position when the tray was hard. The distance between the pins (column 2 in the table) was measured on a toolmaker's microscope.

A stick of no. 2 soft green impression compound was softened in a flame and added to the border of the tray. The tray with added compound was placed in water at 60°C. (140°F.) for about 15 seconds and then seated in the mouth immediately. After removal the trays were chilled in ice water and inspected for proper contour. Excess compound was removed with a knife if in the ridge area, or by resoftening locally with a fine flame from an alcohol torch if the impression compound was on the border. When the contour of the border and the posterior palatal seal were considered satisfactory, zinc oxide-eugenol impression paste was placed in the tray and the impression completed.

The second measurement between the reference pins was made and the difference in per cent between the measurements is shown in column 3 in the table. The final gypsum cast was prepared and a third measurement was made after it had hardened. The difference in per cent between the second and third



Diagrams of upper and lower impression trays indicating placement of stainless steel pins with reference lines on the tongue side, about where the second molars would be

Changes in dimension of impression trays made of self-curing acrylic resin

Column 1	Column 2	Column 3	Column 4	Column 5	Column 6
Type of tray	Distance between reference lines in tray after hardening (inch)	Change after adding impression compound and zinc oxide-eugenol paste %	Change after hardening of gypsum cast %	Change after removal from cast and storage in air for 2 years %	Total change from hardened tray through impression and storage in air for 2 years %
Upper	1.9003	−0.08	+0.13	−0.13	−0.08
Lower	1.8110	−0.04	+0.25	−0.01	+0.20
Lower	2.1187	−0.05	+0.23	−0.32	−0.14

measurements is shown in column 4 in the table.

The impression and cast were then immersed in water at 60°C. (140°F.) for three minutes to soften the impression compound so that the cast could be separated easily from the impression. The impression trays with the impression compound and zinc oxide-eugenol paste coating were stored in air at room temperature for over two years. At the end of that time the final measurement was made between the reference pins (column 5 in the table).

Reference to column 3 in the table shows that the heating, chilling and flaming of impression compound and the use of the zinc oxide-eugenol impression paste had no appreciable effect on the dimensions of the self-curing acrylic resin trays as the shrinkages were always less than one tenth of 1 per cent. In no case was it more than 0.0015 inch.

When the final gypsum cast was poured in the impressions, the trays expanded as expected (column 4 in the table) because of the heat generated when the gypsum hardened and because of the setting expansion of the gypsum. Similar expansions occur when gypsum casts are poured into an acrylic resin denture.

The lower impression trays show more expansion than the upper. This also would be predicted because of the difference in the shape of the upper and lower trays. In the upper and lower trays all of the expansion caused by the gypsum was lost when the casts were removed and the trays were stored for more than two years in air at room temperature (column 5 in the table).

The differences between the original dimensions of the trays (column 2 in the table) and the dimensions after taking the impressions, pouring and removing the casts and storing in air at room temperature for over two years are small (column 6 in the table) and of no clinical consequence. This judgment is based on previous experience of and measurements by the authors in their report, "Method of evaluating the clinical effect of warping a denture."[1]

In conclusion we can say that impression trays made of self-curing acrylic resin are of sufficient dimensional stability under conditions of actual use to be clinically satisfactory. No evidence was found of any severe warpage or distortion when a zinc oxide-eugenol impression paste was used in impression trays made of self-curing acrylic resins.

This investigation was supported in part by research grant D-605, Evaluation of Resin Denture Base Materials, to the American Dental Association from the National Institute of Dental Research, National Institutes of Health.

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†Senior research associate, American Dental Association, National Bureau of Standards.

1. Woelfel, J. B., and Paffenbarger, George C. Method of evaluating the clinical effect of warping a denture: report of case. J.A.D.A. 59:250 Aug. 1959.

The Fédération Dentaire Internationale: its program and policies

Obed H. Moen, D.D.S., Watertown, Wis.

How often have you heard the statement: "If I had known how good that organization was, I would have helped sooner." How many of you have made that same remark?

I am beginning to hear that comment concerning the Fédération Dentaire Internationale—the F.D.I.; not from the 1,600 members of the American Dental Association who are supporting members of the F.D.I. and who receive regularly information regarding international dentistry, but from those who as yet have not become members.

Interwoven in the complexity of governments and national ideologies is the basic problem of health. This problem remains constant, with no regard for geographic boundaries or forms of government. The World Health Organization, the World Medical Association, the Pan American Health Organization and other similar international organizations have made great progress in eradicating some of the epidemic diseases but many forms of disease still remain uncontrolled. Dental disorders are pertinent examples.

When you consider the magnitude of dental disease and its sequelae, you realize that dentistry, as well as medicine, must be represented at the international level. This representation can be achieved only through an international dental organization such as the F.D.I. Through the Fédération Dentaire Internationale, dentistry has the opportunity to contribute its knowledge and technics to those of medicine in an effort to alleviate pain and suffering throughout the world.

Today a dental program is incorporated in each of the eight regional areas of W.H.O. The prestige of the dental profession has made possible its acceptance in the W.H.O. international program. This acceptance affirms the worth of the F.D.I. to the profession. Sixty national dental organizations representing 48 countries with 250,000 dentists are supporting this program because they know its value.

In many of these countries, the percentage of dentists belonging to the F.D.I. varies between 2 per cent and 8 per cent. In the United States, only 1.5 per cent of the dentists are members. Once American dentists realize the increasing importance of the F.D.I., I believe many more will wish to assist its valuable work by becoming supporting members.

Fill out the form on page 196 and return it to me with your check for dues for 1962. Your international contacts will be happy experiences and you will have the satisfaction of knowing that you will be assisting in an important world-wide health development.

If you are among the 1,000 or more dentists from the United States who plan to attend the Cologne Congress in July 1962, please write to me at 6 Main St., Watertown, Wis., for the necessary forms.

If you wish travel information, you may contact C. W. Carrick, Oberlin Bank Bldg., Oberlin, Ohio. Dr. Carrick has been travel consultant for the U.S.A. Section of the F.D.I. for several years.

Even though you do not plan to attend the Congress, the value you will receive from the F.D.I. publications will justify your membership.

6 Main Street

L. Levy
Delaware

C. H. Baldwin
Arizona

M. K. Baklor
Maryland

State Dental Association Presidents

Leon Levy, president of the Delaware State Dental Society, is a periodontist in Wilmington. He obtained his B.A. from the University of Delaware in 1935. After attending the University of Pennsylvania Graduate School of Zoology for one year, he studied dentistry at Temple University, receiving his D.D.S. in 1941. From 1957 to 1959 he studied part time at Columbia University in the graduate department of periodontology. He is a member of Omicron Kappa Upsilon, Northeastern Society of Periodontists, Philadelphia Society of Periodontology, and a diplomate of the American Board of Periodontology. A past president of Temple Beth Emeth Brotherhood, Dr. Levy also is a member of B'nai B'rith, the Jewish Community Center, Congregation Beth Emeth, Cavaliers Country Club, Zionist Organization of America, the Boy Scouts of America, the Veterans of Foreign Wars and the American Legion. While serving with the Army in Italy he won four battle stars. In the past year he served as instructor in the department of periodontology at the University of Pennsylvania Graduate School of Medicine. He is a member of Sigma Epsilon Delta, the Philadelphia Dental Study Club and the Delaware Academy of Medicine. He is married and has two sons: Arnold Glenn, 14, and Michael Herbert, 11. His hobbies are choir singing, amateur shows, gardening, and serving as cantorial soloist at Temple Beth Emeth.

Conrad H. Baldwin is president of the Arizona State Dental Association. A general practitioner in Winslow, Dr. Baldwin received his D.D.S. degree from Northwestern University Dental School in 1934. He is a member of Winslow Lodge of the Masonic Order. Dr. Baldwin is married and the father of three: Greg W., 21, Bruce G., 19, and Marsha D., 14.

Max K. Baklor, president of the Maryland State Dental Association, is a general practitioner in Baltimore. He has served as president of the Baltimore City Dental Society. He is a Fellow of the American College of Dentists and holds membership in the following organizations: Fédération Dentaire Internationale, Omicron Kappa Upsilon, American Association of Endodontists, Masonic Order and Scottish Rite. He has served as attending dental surgeon at the Sinai Hospital. Dr. Baklor is the author of articles on diathermy in dentistry, and desiccation and sterilization of root canals by electrosurgery. From 1928 to 1945 Dr. Baklor served as instructor at the Sinai Hospital School of Nursing. He is married and the father of a son, Armand. A member of Alpha Omega, he has served as editor of the fraternity's journal, as regent and as president of the Baltimore alumni. For years he has served on the medical executive committee of the Council of Social Agencies and the medical care committee of the Maryland State Planning Commission. His hobbies include photography, reading, and social service work.

A. Benavent, Jr.
Puerto Rico

R. E. Busby
Mississippi

I. Shulman
District of Columbia

1961

Arturo Benavent, Jr., a general practitioner in Mayaguez, is president of the Puerto Rico Dental Association. Dr. Benavent received his B.S. degree in 1942 from the University of Maryland, and a D.D.S. degree in 1945 from that university's Dental School. He served in 1954 as vice-president of the Colegio de Cirujanos Dentistas, and in 1959 as president of the Fourth District Dental Society. He is a member of the American Society of Clinical Hypnosis. Commissioned a lieutenant (j.g.) in the U.S. Navy Reserve in 1945, Dr. Benavent served with the U.S. Marines in Parris Island, and also served at Charleston, S.C., Greensboro, N.C. and the Ramey Air Force Base in Puerto Rico. He is a member and former president of the Mayaguez Lions Club, and a member of the Mayaguez Y.M.C.A., Phi Sigma Alpha, Psi Omega, Western Yacht Club, Yaguez Rifle, Pistol and Shotgun Club, Western Fishing and Hunting Club, Sportsman Club of America, and the International Oceanographic Foundation. Dr. Benavent is a member of the advisory committee of the University of Puerto Rico Dental School. Married, he is the father of three—Arturo III, 13, Patricia Ann, 10, and Harry Herbert, 6. His hobbies are deep-sea fishing, yachting, and participation in civic activities.

Robert Edward Busby, president of the Mississippi Dental Association, is a general practitioner in Hattiesburg. He attended Mississsippi College for two years, and in 1928 obtained his D.D.S. degree from Tulane University. Dr. Busby is a Fellow of the American College of Dentists, and a member of the South Eastern Academy of Prosthodontics, the Hattiesburg Chamber of Commerce, Temple Baptist Church, and the Hattiesburg Civic Association. He has served as president of the Lions Club, the Hattiesburg Country Club, and as past exalted ruler of the Elks Club. He has served as president of the Third District Dental Society, and as trustee of his state association, and member of the House of Delegates of the American Dental Association. Dr. Busby is married. His hobbies are golf, hunting, fishing and sailing.

Israel Shulman is president of the District of Columbia Dental Society. He received his D.D.S. from Georgetown University School of Dentistry in 1936 and interned at the City Hospital, Welfare Island, N.Y. Dr. Shulman is a general practitioner. He has served his constituent society as a member of its executive committee for 11 years and as associate editor of its journal. He has served as chairman of the dental section of both the Community Chest and the United Jewish Appeal. Dr. Shulman is a member of Omicron Kappa Upsilon, Alpha Omega, Phi Eta Sigma, Phi Sigma Delta fraternities; American Society of Geriatric Dentistry, American Society of Dentistry for Children, American Association for the Advancement of Science, Masonic Order and the Maimonides Dental Society (a founder and the first president). Dr. Shulman is married and the father of three: Lawrence A., 18, Neil B., 15, and Stanley E., 12. His chief interests are working in organized dentistry and civic and philanthropic endeavors, and his hobbies are tennis and travel.

reports of councils and bureaus

Association opposes O.A.S.D.I. health care plan

COUNCIL ON LEGISLATION

On August 3, Matthew Besdine, chairman of the Association's Council on Legislation, testified before the Committee on Ways and Means of the House of Representatives. Hal M. Christensen, Washington counsel for the Association, accompanied Dr. Besdine. In his presentation Dr. Besdine emphasized the Association's long-standing opposition to compulsory health insurance. He described the serious objections to the inclusion of health care benefits under the O.A.S.D.I. provisions of the Social Security Act. Dr. Besdine also stressed the Association's support of the recently enacted Kerr-Mills Act and urged that that program be given a chance to solve the aged health care problem.

I am Matthew Besdine of Brooklyn, N. Y., chairman of the American Dental Association's Council on Legislation. I am also president of the Dental Society of the State of New York. I am accompanied by Mr. Hal M. Christensen, the Association's Washington counsel.

In accordance with the instructions contained in the press release issued by the chairman of this Committee dated July 11, 1961, we have attempted to keep this statement brief and free of repetition.

The members of the American Dental Association have an intense interest in H.R. 4222 and similar measures which would embark the federal government on a massive health care program for a large segment of the American population. Many of this Association's state and local constituent and component dental societies would have welcomed the opportunity to appear before this committee to present personally their views on this important legislation. However, in keeping with the chairman's request, in the interest of conserving the valuable time of the members of this committee, the following comments and recommendations will constitute the formal presentation representing the position of organized dentistry in the United States.

The American Dental Association has a membership of 95,000 and of this number, about 85,000 are engaged in the private practice of dentistry in large and small communities throughout the country.

The members of the dental profession are gravely concerned about the problem of extending the availability of dental health care to all segments of the population. This is reflected in official policy which establishes as one of the major missions of the American

Dental Association the duty to assure to the greatest extent possible that dental care is available to all people of this nation regardless of income, geographic location or any other factor.

Thus, at the outset, in the interest of objectivity, it might be conceded that the American Dental Association and the sponsors of H.R. 4222 have a common objective in that both are motivated by a desire to bring adequate health care to a segment of the population which includes some persons who may not be able to afford such care. The only point of difference that arises is how best this common objective can be accomplished. The American Dental Association does not believe that the means provided in H.R. 4222 and similar legislation constitutes a desirable or adequate approach.

H.R. 4222 adheres to the basic framework of legislation introduced in recent sessions of Congress by former Representative Forand of Rhode Island and would finance nursing home and other health care benefits for persons meeting O.A.S.D.I. eligibility requirements. Such benefits would be provided without taking into consideration the economic needs of eligible recipients and no consideration would be given under the program to aged persons unable to qualify under O.A.S.D.I. rules.

Although increasing numbers of dentists participate in hospital practice, it is recognized that dental care would be involved only to an incidental degree in the benefits proposed in H.R. 4222. At the same time, it is recognized that H.R. 4222 has far reaching implications for members of all health professions as well as for others interested in the nation's health. It would be naive, we believe, to ignore the real probability that once this type of program is initiated, it will be extended progressively to include comprehensive health care for the entire population. It is this potentiality within H.R. 4222 that gives pause and concern to health practitioners everywhere and is the reason for my appearance before this Committee today.

This Association does not believe there is a conscious desire on the part of the proponents of H.R. 4222 to introduce a system that may lead to a degeneration in the present high quality of the health services to which our people have become accustomed. Nor do we believe that the health practitioners of the country consciously would perform lower quality services because the government, rather than private individuals or agencies, pays the bill. It is believed, however, that the inescapable tendency would be for practitioners to perform their services in accordance with the rules, regulations and directives promulgated by the federal agency having sole control over their ability to provide a livelihood for themselves and their families. With the Secretary of Health, Education and Welfare or his delegate acting for the federal government as the sole purchaser of health services, it is feared that in the rendering of such services, regulation would be substituted for professional judgment and high quality would be replaced by mediocrity.

If the Administration of the national health plan now under consideration by this Committee follows the pattern of other government health care programs, mass production would become the watchword and individualized, personalized care would become the rarity. Usually, the pattern is as follows: First, the government overcommits itself; it promises more than it can deliver. Second, costs are underestimated. Third, services or fees for services or both are cut, usually by laymen concerned with the budget rather than with the adequacy of care. Fourth, many practitioners withdraw from the program, freedom of choice evaporates, quality of care degenerates and patient-beneficiaries become dissatisfied and disillusioned. This sequence of events occurred in connection with the so-called Veterans Administration "hometown dental program" which was instituted after World War II and which finally, after much bitter experience, was revised by a law enacted in the early 1950s.

In some of the other ventures the federal government has made into the operation of dental care programs, quota systems have been established and treatment has been stereotyped and rendered according to the strict directions of a government manual. In certain of the military programs, dentists were required to serve on what they nicknamed the "amalgam line"; their performance being rated and their promotions governed by the number—not the difficulty or quality—of dental operations performed in a given period. Their performance, in many instances, was judged by nondentists having an eye on the budget and the time clock rather than on the adequacy of the treatment. Certainly, the patients involved did not receive the best care under these circumstances.

It is believed inevitable that if a program such as is envisioned in H.R. 4222 is put in effect, the result will be constantly rising costs and lower quality care. The following excerpts from articles discussing the National Health Scheme in Great Britain illustrate our concern.

"There is one thing certain: if the rate of costs increases in the next ten years as it has in the first ten, then the great social experiment of a National Health Service could

bring Great Britain to a state of penury. The first year's bill in 1948 was 360,000,000 pounds. After ten years (1958-1959) it was 757,000,000 pounds."[1]

"An itemized scale of fees, linked to a restriction of clinical freedom, is based upon an average speed of work for operation of average difficulty; it takes into account average expense and average abilities; it provides automatically for the average sort of treatment required . . . it stifles initiative, discourages more intricate forms of work which are advantageous to the patients' future dental health, rebuffs the individualist and puts a brake upon progress."[2]

"We are in danger of becoming a piecework production industry."[3]

"The modern student has a high standard of operative work and skill taught in the schools today. . . . When he leaves [school] and enters the National Health Service he is frustrated by the fact that the scheme cannot often afford elaborate and advanced technique to be carried out, and the patients are so grossly taxed they may not be able to afford the better and more costly work to be carried out privately."[4]

Quite frankly we are disturbed, and we believe that many members of the American public are disturbed by the prospect of assembly line health dispensaries in the grim atmosphere of conformity and regimentation with the government's budgeteers in the saddle determining, after the fact, whether this service or that service was necessary to preserve the health of the patient. We do not believe such a system can maintain high quality health care for the public. We do not believe such a system will serve the best interests of the public or the health professions.

We are further concerned that the system envisioned in H.R. 4222 would place undesirable limitations upon the availability of health personnel and facilities, both for persons over 65 and for all age groups. The Administration has recognized the acute health manpower and facilities shortage and has recommended measures to help overcome the problem. The American Dental Association has endorsed the legislation (H.R. 4999, S. 1072) to stimulate the establishment of additional dental and medical schools and to attract additional personnel to the health professions. Existing health care demands cannot be met and with predictable population growth such demands will become increasingly acute. A government program of health care for one age group in the population will only serve to create further imbalance and displace persons in other age groups. The profession is especially fearful that adoption of a government program which concentrates on adults will result in neglect of children's health needs. This has occurred under the British system and is completely contrary to all accepted professional standards of dental care.

At the same time, we recognize that the existing system for providing health care is not perfect even though under it, we have achieved the highest standards of health care in the world.

There are deficiencies in the availability of dental care which we would like to see corrected. We know there are aged and other institutionalized or homebound persons who are not receiving the care they should have. There also are children, some of them suffering from physical and mental debilities or other unfortunate circumstances, who need attention. In short, there are people in all age groups who require some form of assistance in obtaining the care they need. As we have said, we favor programs to meet these needs, but do not believe the total problem will be alleviated by singling out persons in one age group and permitting the Social Security Administration to pay their health care bills.

We believe there are other more practical and desirable methods of meeting our health care problems. As indicated earlier, we favor legislation to help produce additional practitioners and facilities. We believe President Kennedy was correct in his appraisal of the serious shortages in this area. We believe the corrective legislation his Administration has sponsored is sound. We believe the Community Health Services and Facilities Act recently passed by the House of Representatives is a forward step in assisting the aged and the chronically ill. We also favor increased emphasis on preventive measures. We have consistently supported expansion of the research programs administered by the National Institutes of Health, but it has only been in recent years that Congress has appropriated funds on a realistic basis for these programs.

In addition, we are strongly supporting legislation to strengthen state and local dental public health programs. Enactment of this legislation (H.R. 4742 and S. 917) would assist states and communities in bringing dental health care to the chronically ill and the aged, handicapped children and others in need. It would provide funds to purchase portable dental units and other specialized equipment necessary to provide treatment to the unfortunate. In the opinion of this Association, such programs administered at the state and local levels with minimal stimulatory grants-

in-aid from the federal government offer a far superior means of meeting our health care problems than the drastic and irreversible departure proposed in H.R. 4222.

We believe further, in accordance with the same philosophy, that the Kerr-Mills program should be given a chance to work. Through refinement and expansion of efforts such as these, it is believed that high standards can be maintained and the availability of health care can be extended to all those who need it.

Finally, I wish to point out again that the American Dental Association has given support to five of the six major elements of the Administration's health program laid before Congress on February 10, 1961. We believe firmly, however, that we must object to that part of the program represented by H.R. 4222.

It should be emphasized that this Association is not concerned with slogans or labels manufactured to oppose or to support H.R. 4222. We believe it is our proper function and responsibility to evaluate health proposals on their merits, strictly from the professional viewpoint. Specifically, we believe it is our proper role to determine as best we can whether any such proposal can be expected to extend availability of health care without lowering its quality, thus serving the best interest of the public. In our opinion, H.R. 4222 does not meet this test, and it is respectfully recommended that the bill be rejected by this Committee.

1. Leatherman, G. H. Dentistry in Great Britain 1859-1959. J.A.D.A. 61:652 Nov. 1960.

2. Future of dentistry in welfare state. Editorial. Brit. D.J. 101:273 Oct. 16, 1956.

3. Fielder, E. H. Then and now: the change in dental practice. Brit. D.J. 109:79 Aug. 2, 1960.

4. Claremont, L. E. Observations on 40 years in British dentistry. Brit. D.J. 103:175 Sept. 3, 1957.

New additions to Film Library

BUREAU OF AUDIOVISUAL SERVICE

The following audiovisual material has been added to the Film Library and is available for rental.

What Do We Know About Teeth? • 16 mm., color, sound, 14½ minutes, cleared for television. Produced in 1961 by the Bureau of Dental Health Education, American Dental Association, with the assistance of Miss Edith Ford, curriculum director of the Park Ridge, Ill. elementary schools. Production services: Gilbert Altschul Productions. Available for rental ($3) or purchase ($75) from the Bureau of Audiovisual Service, American Dental Association.

As the children in the second grade classroom begin talking about teeth, they discover that there are many questions to which they do not know the answers. Three committees are formed to find out why they go to the dentist, when and how to brush their teeth and what foods do to their teeth. Later each chairman reports his committee's findings to the class. The school nurse shows the youngsters the proper way to brush teeth. The project ends with the party the children give for their mothers. The entertainment is a play about teeth, followed by refreshments consisting of snack foods which the children have learned will not harm the teeth. This film was made in a classroom, using the actual pupils, teacher and school nurse. An expert in the field of elementary school curriculum development provided the educational guidance and direction that made the film possible. The purpose of the film is threefold: (1) to motivate children of the primary grades to learn more about their teeth and oral health, (2) to provide some factual information that will lead them on to search for more knowledge, and (3) to provide the classroom teacher with some ideas which she may find useful in teach-

ing dental health. The photography and sound are excellent. This film is highly recommended for grades 1, 2 and 3 and classroom teachers.

Class V Gold Foil Restoration • 16 mm., color, sound, 35 minutes. Prepared by Gerald D. Stibbs, D.M.D., University of Washington, Seattle, in cooperation with Morgan, Hasting & Company. Produced in 1960 in the Photography and Television Department, University of Washington. Available for rental ($3.50) from the Bureau of Audiovisual Service, American Dental Association.

Preparation of the patient, including placing of the rubber dam, is shown in detail. The preparation of the cavity is clearly demonstrated followed by the placement of a Class V gold foil restoration on the lower left cuspid using a cohesive and noncohesive gold foil. Other condensing technics are also discussed. The demonstration includes some models for better viewing and clarification. Postoperative views show the readaptation of the healthy gingival tissues. The photography is outstanding and the sound is good. This is an excellent teaching film which will be of interest to all dentists. It will also be of interest to dental assistants who would like to observe efficient assisting technic.

Cricothyroidotomy • 2x2 slides, color. Produced by the U. S. Naval Dental School, National Naval Medical Center, Bethesda, Md. Available for rental ($2.50) from the Bureau of Audiovisual Service, American Dental Association.

This slide film presentation consists of 38 slides and a booklet which contains textual lecture material related to each slide. The photographic work is excellent and the text, while simple and concise, provides a thorough discussion of the cricothyroidotomy procedure. The viewing time is sufficiently short to permit the inclusion of the lecture on virtually any type of society program without impinging on other activities. The artwork and photography are excellent. This slide film is especially recommended to constituent and component society civil defense committees.

Changes in the distribution of dentists, 1956-1960

BUREAU OF ECONOMIC RESEARCH AND STATISTICS

Two earlier studies analyzed year-to-year changes in the distribution of dentists between 1952 and 1956.[1,2] Both studies indicated an uneven distribution of dentists throughout the United States but also showed that the distribution of dentists improved, that is, became more uniform between 1952 and 1956. Improvement was evident in all types of geographic units: counties, districts, regions and states.

The present analysis up-dates the previous studies. Although data are presented in a slightly different way, they are based on the same source material used in the earlier analyses, the booklet *Distribution of Dentists in the United States by State, Region, District and County,* which is published annually by the Bureau of Economic Research and Statistics.

One method of ascertaining whether there has been improvement in the distribution of dentists in relation to population is to measure the dispersion of population-dentist ratios. If dentists were distributed geographically in the same way as the population, all population-dentist ratios would be equal; in other words, there would be no dispersion of ratios. Conversely, the greater the difference between the geographic distribution of dentists and that of the population, the greater the dispersion of the population-dentist ratios.

Two measures of dispersion were calculated, the standard deviation and coefficient of variation. The first measures the amount of dispersion in absolute terms. The smaller the standard deviation, the greater the uniformity of the population-dentist ratios. The coefficient of variation measures dispersion relative to the mean, thus enabling comparison between two or more series with different mean values.

Population-dentist ratios were more uniform in 1960 than in 1957 for counties, districts, regions and states. The standard deviation of the county ratios decreased from 3,009 in 1957 to 2,831 in 1960, district ratios from 1,689 to 1,534, region ratios from 942 to 848 and state ratios from 787 to 740. As with the mean ratios, the deviations of the county and district ratios were lower each year between 1957 and 1959 but increased between 1959 and 1960. Standard deviations of the state and region ratios were lower in each succeeding year (Table 1).

The distributions of dentists and of population were most uniform among states and least uniform among counties. In 1960 the coefficient of variation was 77 per cent for the county population-dentist ratios but only 34 per cent for the state ratios.

Data were further analyzed for counties, the most numerous of the four geographic units. Tables 2 and 3 compare 1956 with 1958 and 1958 with 1960 population-dentist ratios. Between 1956 and 1958 and 1958 and 1960 a majority of counties with relatively large population-dentist ratios showed improvement in the distribution of population and dentists in that the ratios were reduced in each of the two periods. For example, in 68 per cent of the counties with 6,000-7,999 persons per dentist in 1956 the ratio was lower in 1958 and 60 per cent of the counties in this ratio group in 1958 had smaller population-dentist ratios in 1960.

Improvement in the dentist distribu-

Table 1 • Measures of dispersion of population-dentist ratios, by county, district, region and state

Statistical measure	Area			
	County	District	Region	State
1957				
Mean ratio	3,724	3,035	2,446	2,213
Standard deviation	3,009	1,689	942	787
Coefficient of variation	80.8	55.7	38.5	35.6
1958				
Mean ratio	3,633	2,986	2,430	2,200
Standard deviation	2,727	1,549	913	764
Coefficient of variation	75.1	51.9	37.6	34.7
1959				
Mean ratio	3,579	2,923	2,395	2,196
Standard deviation	2,680	1,478	880	761
Coefficient of variation	74.9	50.6	36.7	34.7
1960				
Mean ratio	3,665	2,939	2,381	2,181
Standard deviation	2,831	1,534	848	740
Coefficient of variation	77.2	52.2	35.6	33.9

tion is evidenced by these data between 1958 and 1960 as well as between 1956 and 1958. It must be pointed out, however, that the data also show that within each ratio classification from 4,000-4,999 to the largest of 10,000 or more persons per dentist the number and proportion of counties which experienced a reduction in the ratio between 1958 and 1960 were substantially less than in the previous two-year comparison. Conversely, the number and proportion of counties in each of these ratio groupings which experienced an increase in the population-dentist ratio between 1958 and 1960 were substantially higher than between 1956 and 1958.

These data coupled with the earlier analysis on dispersion of the county population-dentist ratios suggest that although the county population and dentist distributions have become more uniform in the past 3 to 4 year period, the degree of improvement leveled off. Also, it is possible that the long-time trend indicating closer correspondence and uniformity between the two distributions may not continue. Whether the latter is true cannot be determined until population-dentist ratios for future years are analyzed.

The 1960 distributions of dentists and of population by state are shown in Table 4. States in the Southeast and Southwest regions have for many years had a higher number of persons per dentist than other groups of states. Between 1956 and 1960 the population-dentist ratios improved in each of the 15 states in the two regions. Between 1959 and 1960, however, the ratios increased in five of the 15 states. In the balance of 35 states and District of Columbia, population-dentist ratios were reduced in 15 states between 1956 and 1960; between 1959 and 1960, ratios decreased for 22 states in this group.

The number of counties without dentists was approximately the same in 1960 as in 1956, 222 and 226, respectively. Although the number of counties without dentists had little change, the counties included in the two counts differed to a greater extent. Twelve per cent of the counties that were without dentists in 1956 had dentists two years later and 13 per cent of the counties with dentists in 1958 had dentists in 1960. Moreover, in 1956 there were 33 counties which had dentists but did not have two years later. In 1958, 20 counties had dentists but did not in 1960.

Table 2 • Comparison of 1956 and 1958 county population-dentist ratios, according to 1956 ratio

1956 ratio	Percentage of counties for which 1958 ratio							No dentists in 1958	Total	Number of counties
	Increased			Decreased			Remained unchanged			
	Less than 1 per cent	1–10 per cent	10 per cent or more	Less than 1 per cent	1–10 per cent	10 per cent or more				
Less than 1,500	5.6	33.8	29.0	3.0	18.2	6.5	3.0	.9	100.0	231
1,500–1,999	2.6	27.2	26.9	3.4	28.4	8.3	3.0	.2	100.0	494
2,000–2,499	4.2	24.4	24.7	2.5	26.7	13.1	4.0	.4	100.0	475
2,500–2,999	1.7	19.3	29.2	2.0	25.9	18.7	2.3	.9	100.0	348
3,000–3,499	2.6	13.1	23.1	1.5	33.5	22.4	3.4	.4	100.0	268
3,500–3,999	2.6	14.4	24.2	1.5	23.7	27.9	5.7	0	100.0	194
4,000–4,999	1.5	15.4	17.2	1.8	29.7	28.9	4.0	1.5	100.0	273
5,000–5,999	1.6	9.3	14.8	4.4	27.5	31.4	6.6	4.4	100.0	182
6,000–7,999	3.1	9.9	14.1	4.7	30.7	32.3	3.1	2.1	100.0	192
8,000–9,999	5.0	13.7	8.7	.0	30.1	33.8	6.2	2.5	100.0	80
10,000 or over	3.8	14.3	7.6	1.0	22.9	39.9	4.8	5.7	100.0	105
No dentists	—	—	11.5	—	—	—	—	88.5	100.0	226
All counties	2.8	18.3	21.8	2.4	25.2	18.4	10.0	1.1	100.0	3,068

Table 3 • Comparison of 1958 and 1960 county population-dentist ratios, according to 1958 ratio

1958 ratio	Percentage of counties for which 1960 ratio							No dentists in 1960	Total	Number of counties
	Increased			Decreased			Remained unchanged			
	Less than 1 per cent	1–10 per cent	10 per cent or more	Less than 1 per cent	1–10 per cent	10 per cent or more				
Less than 1,500	3.8	31.9	25.2	3.8	26.2	7.6	1.0	.5	100.0	210
1,500–1,999	3.1	30.2	21.7	3.1	26.5	13.3	2.1	.0	100.0	480
2,000–2,499	3.1	26.9	24.0	3.3	21.6	19.7	1.4	.0	100.0	487
2,500–2,999	2.0	19.4	27.5	.9	26.4	20.6	2.6	.6	100.0	345
3,000–3,499	1.3	23.6	24.3	1.6	19.1	28.5	1.3	.3	100.0	309
3,500–3,999	1.5	21.2	18.7	.5	21.7	33.9	2.0	.5	100.0	203
4,000–4,999	1.4	15.9	23.9	.7	20.3	34.2	2.2	1.4	100.0	276
5,000–5,999	2.2	18.2	20.4	2.2	17.7	33.2	3.3	2.8	100.0	181
6,000–7,999	2.3	16.3	18.0	1.7	16.3	42.5	1.7	1.2	100.0	172
8,000–9,999	1.3	21.5	17.7	1.3	19.0	37.9	0	1.3	100.0	79
10,000 or over	0	24.7	17.2	0	8.6	44.1	2.2	3.2	100.0	93
No dentists	—	—	13.3	—	—	—	—	86.7	100.0	233
All counties	2.1	21.9	22.1	1.9	20.2	22.8	8.3	.7	100.0	3,068

Table 4 • Distribution of dentists by region and state, 1960

Region and state	Number of dentists	Population per dentist	Estimated population
New England	6,823	1,489	10,160,000
Connecticut	1,778	1,362	2,421,500
Maine	447	2,053	917,900
Massachusetts	3,615	1,390	5,023,900
New Hampshire	299	1,915	572,500
Rhode Island	496	1,720	853,200
Vermont	188	1,973	371,000
Middle East	28,117	1,437	40,412,600
Delaware	176	2,488	437,900
District of Columbia	752	1,104	830,000
Maryland	1,298	2,416	3,136,200
New Jersey	3,927	1,507	5,918,000
New York	14,179	1,180	16,726,200
Pennsylvania	7,063	1,614	11,402,300
West Virginia	722	2,717	1,962,000
Southeast	12,938	2,825	36,556,300
Alabama	1,003	3,200	3,209,600
Arkansas	581	2,991	1,737,900
Florida	2,357	2,046	4,822,900
Georgia	1,133	3,417	3,871,500
Kentucky	1,136	2,695	3,061,200
Louisiana	1,204	2,614	3,146,800
Mississippi	622	3,424	2,130,000
North Carolina	1,399	3,258	4,558,200
South Carolina	530	4,566	2,420,200
Tennessee	1,506	2,373	3,574,000
Virginia	1,467	2,743	4,024,000
Southwest	5,115	2,797	14,307,100
Arizona	487	2,589	1,261,000
New Mexico	272	3,470	943,900
Oklahoma	938	2,441	2,290,100
Texas	3,418	2,871	9,812,100
Central	26,632	1,767	47,055,200
Illinois	6,413	1,570	10,067,600
Indiana	2,204	2,121	4,674,800
Iowa	1,660	1,689	2,804,100
Michigan	4,122	1,957	8,065,400
Minnesota	2,416	1,399	3,378,800
Missouri	2,432	1,809	4,400,100
Ohio	4,820	2,012	9,698,600
Wisconsin	2,565	1,546	3,965,800
Northwest	5,059	1,819	9,200,100
Colorado	1,044	1,648	1,720,800
Idaho	335	1,929	646,300
Kansas	1,052	2,049	2,155,600
Montana	370	1,858	687,500
Nebraska	925	1,567	1,449,400
North Dakota	277	2,290	634,400
South Dakota	311	2,219	690,100
Utah	578	1,537	888,600
Wyoming	167	1,960	327,400
Far West	13,807	1,520	20,991,400
Alaska	57	3,872	220,700
California	9,840	1,539	15,142,100
Hawaii	409	1,611	658,900
Nevada	133	2,138	284,300
Oregon	1,380	1,316	1,815,500
Washington	1,988	1,444	2,869,900
Total number listed by state	98,491		

Table 4 • Distribution of dentists by region and state, 1960—(Continued)

Region and state	Number of dentists	Population per dentist	Estimated population
Federal Dental Services	6,649		
Air Force	1,808		
Army	2,011		
Navy	1,724		
Public Health Service	342		
Veterans Administration	764		
United States total	105,140	1,699	178,682,700
Outlying areas			
American Samoa	1	23,000	23,000
Guam	7	6,000	42,000
Marshall Islands	1	16,200	16,200
Panama Canal Zone	14	4,286	60,000
Puerto Rico	371	6,477	2,403,000
Virgin Islands	8	4,000	32,000

Sources: Number of dentists is the number listed in the 1961 American Dental Directory as of mid-1960. Retired dentists and 1960 graduates are included. Populations of states and regions are estimates as of January 1, 1960, from Sales Management, July 10, 1960. Populations of outlying areas are estimates as of January 1, 1960, from Commercial Atlas and Marketing Guide, 1961, Rand McNally & Company, pages 4 and 5.

Of the 222 counties in which there were no dentists in 1960, a majority had a relatively small population, small per capita income, or small per capita retail sales, or a combination of these three factors. In 69 of the 222 counties, 1960 population exceeded 6,000 persons (Table 5). Per capita buying income (1959) in 61 of these counties was 10 per cent or more less than the per capita buying income of the state in which the county was located. Per capita retail sales (1959) for 63 of this same group of counties were 10 per cent or more less than that for the state. At the opposite end of the scale, 94 counties had a population of less than 3,000 persons in 1960. Thirty-five of these counties had a per capita buying income

Table 5 • Comparison of county and state 1959 per capita buying income and 1959 per capita retail sales for counties without dentists in 1960, according to 1960 county population

1960 county population	Number of counties					
	Per capita buying income			Per capita retail sales		
	County 10 per cent or more under state	County less than 10 per cent under state	County higher than state	County 10 per cent or more under state	County less than 10 per cent under state	County higher than state
10,000 and over	18	0	1	18	1	0
8,000–9,999	11	0	0	11	0	0
6,000–7,999	32	4	3	34	2	3
5,000–5,999	15	3	1	18	0	1
4,000–4,999	16	2	1	16	0	3
3,000–3,999	14	0	7	16	2	3
2,000–2,999	16	8	19	31	4	8
1,000–1,999	15	9	10	32	0	2
Less than 1,000	4	6	7	14	2	1
Total counties	141	32	49	190	11	21

that was 10 per cent or more under that for the state; in 36 of the counties, per capita buying income exceeded the state's. Per capita retail sales in 77 of the 94 counties were 10 per cent or more less than the state's and in 11 counties per capita retail sales were higher than the retail sales for the state in which the county was located. The number of counties without dentists in which low population, low per capita buying income and low per capita retail sales did not prevail can be noted in Table 5.

The booklet *Distribution of Dentists in the United States by State, Region, District and County* may be obtained on request from the Bureau of Economic Research and Statistics. In addition to information on the distribution of dentists and population, it contains information on population growth, per capita income and per capita retail sales by county, district, region and state.

1. American Dental Association, Bureau of Economic Research and Statistics. Changes in distribution of dentists during 1952-1954. J.A.D.A. 51:461 Oct. 1955.

2. American Dental Association, Bureau of Economic Research and Statistics. Changes in distribution of dentists during 1954-1956. J.A.D.A. 56:105 Jan. 1958.

Expenditures and prices for dental and other health care, 1935-1960

BUREAU OF ECONOMIC RESEARCH AND STATISTICS

Consumer expenditures for various goods and services are estimated each year by the U.S. Department of Commerce. Data on prices paid by consumers for various items are collected by the U.S. Department of Labor. The federal statistics relating to expenditures and prices for dental care have been published since the 1930's—the only long-term series of data available on dental costs.

EXPENDITURES

The Department of Commerce estimated that consumers paid $1,992,000,000 to dentists in 1960 (Table 1). This amount was estimated to be 10.1 per cent of expenditures for all types of health care, and .61 per cent of total consumer expenditures for all items (Tables 2 and 3). Dental care provided by governmental and philanthropic agencies is not included in these estimates.

The original estimates are often revised in later years by the Department of Commerce, and the revision is usually, but not always, upward. For example, the original estimate of dental expenditures in 1958 was $1,674,000,000, and this estimate has now been revised to $1,850,000,000. It seems likely that the estimate for 1960, $1,992,000,000, will be revised upward.

The Bureau of Economic Research and Statistics estimated the 1958 national dental bill at $2,000,000,000, based on gross incomes of dentists reported in *The 1959 Survey of Dental Practice*. Health Information Foundation estimated the national dental bill at $2,400,000,000 for

Table 1 • Consumer expenditures for health care, 1935–1960 (millions of dollars)

Item	1960	1959	1958	1957	1956	1955	1954	1953	1952	1951	1950	1940	1935
Dentists	1,992	1,894	1,850	1,737	1,625	1,508	1,406	1,234	1,098	997	961	419	302
Physicians	4,960	4,608	4,206	3,797	3,512	3,189	3,109	2,840	2,657	2,519	2,427	913	731
Other professional services	886	842	787	741	706	653	634	586	544	510	482	173	151
Drug preparations and sundries	3,930	3,604	3,310	3,062	2,869	2,473	2,163	2,137	2,058	1,979	1,719	635	474
Ophthalmic products and orthopedic appliances	1,219	1,185	991	990	814	685	595	604	580	546	486	186	131
Privately controlled hospitals and sanitariums	5,195	4,693	4,281	3,880	3,524	3,229	2,962	2,729	2,486	2,248	2,037	527	406
Medical care and hospitalization insurance*	1,541	1,376	1,220	1,210	1,076	1,090	1,056	942	749	641	629	165	93
Total	19,723	18,202	16,645	15,417	14,126	12,827	11,925	11,072	10,172	9,440	8,741	3,018	2,288

*Premiums minus claims paid.

Source: Survey of Current Business, July 1961, U.S. Income and Output (1958), and National Income, 1954 Edition, publications of the Office of Business Economics, U.S. Department of Commerce.

the year ending at mid-1958, based on interviews with a cross-section of the population.

The estimate for dental care expenditures for 1960 ($1,992,000,000) was about double the estimate for 1950 ($961,000,000) and 6.6 times as high as the estimate for 1935 ($302,000,000). Total expenditures for health care were estimated at $19,723,000,000 for 1960, 126 per cent higher than the 1950 estimate ($8,741,000,000) and 762 per cent higher than the 1935 figure ($2,288,000,000).

Expenditures for health care have increased substantially, not only in absolute amount but also as a percentage of total consumer expenditures (Table 3). From 1950 to 1960, the increase was from 4.48 per cent to 6.00 per cent of

Table 2 • Percentage distribution of the health dollar, 1935-1960

Item	1960	1959	1958	1957	1956	1955	1954	1953	1952	1951	1950	1940	1935
Dentists	10.1	10.4	11.1	11.3	11.5	11.7	11.8	11.1	10.8	10.6	11.0	13.9	13.2
Physicians	25.2	25.3	25.3	24.6	24.9	24.9	26.1	25.7	26.1	26.7	27.8	30.2	31.9
Other professional services	4.5	4.6	4.7	4.8	5.0	5.1	5.3	5.3	5.4	5.4	5.5	5.7	6.6
Drug preparations and sundries	19.9	19.8	19.9	19.9	20.3	19.3	18.1	19.3	20.2	20.9	19.7	21.0	20.7
Ophthalmic products and orthopedic appliances	6.2	6.5	6.0	6.4	5.8	5.3	5.0	5.5	5.7	5.8	5.5	6.2	5.7
Privately controlled hospitals and sanitariums	26.3	25.8	25.7	25.2	24.9	25.2	24.8	24.6	24.4	23.8	23.3	17.5	17.8
Medical care and hospitalization insurance	7.8	7.6	7.3	7.8	7.6	8.5	8.9	8.5	7.4	6.8	7.2	5.5	4.1
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: Calculated by Bureau of Economic Research and Statistics from data in Table 1.

Table 3 • Percentage of total consumer expenditures spent for specified items of health care, 1935-1960

Item	1960	1959	1958	1957	1956	1955	1954	1953	1952	1951	1950	1940	1935
Dentists	.61	.60	.63	.61	.60	.59	.59	.53	.50	.48	.49	.58	.54
Physicians	1.51	1.47	1.43	1.33	1.30	1.24	1.31	1.22	1.21	1.20	1.24	1.27	1.30
Other professional services	.27	.27	.27	.26	.26	.25	.27	.25	.25	.24	.25	.24	.27
Drug preparations and sundries	1.19	1.15	1.13	1.07	1.06	.96	.91	.92	.94	.94	.88	.88	.84
Ophthalmic products and orthopedic appliances	.37	.38	.34	.35	.30	.27	.25	.26	.26	.26	.25	.26	.23
Privately controlled hospitals and sanitariums	1.58	1.49	1.46	1.36	1.31	1.26	1.24	1.17	1.13	1.07	1.05	.74	.72
Medical care and hospitalization insurance	.47	.44	.42	.42	.40	.43	.44	.41	.34	.31	.32	.23	.16
All health care	6.00	5.80	5.68	5.41	5.23	5.00	5.01	4.76	4.63	4.50	4.48	4.20	4.06

Source: Calculated by Bureau of Economic Research and Statistics from estimates of consumer expenditures contained in the following publications of the Office of Business Economics, U.S. Department of Commerce: Survey of Current Business, July, 1961, U.S. Income and Output (1958), and National Income, 1954 Edition.

consumer expenditures. During this period, expenditures for dental care increased from .49 per cent to .61 per cent of the consumer's dollar.

The proportion of the health dollar paid for professional services declined between 1935 and 1960 (Table 4). Dental bills accounted for 10.1 cents of the health dollar in 1960, compared to 13.2 cents in 1935, a decline of 23.5 per cent. The proportionate decline in the share of the health dollar paid to physicians was about the same as that for dentists. The decline for "other professional services" was slightly greater than the decline for dentists and physicians. There was a slight decline in the proportion of the health dollar spent for drug preparations and sundries. The share of the health dollar spent for other health items increased. The increase was large for medical care and hospitalization insurance (90.2 per cent) and for rates in privately controlled hospitals and sanitariums (47.8 per cent).

PRICE CHANGES

According to the Department of Labor, dentists' fees rose 37.3 per cent between the base period of 1947-1949 and the year 1960 (Table 5). Increases in fees and prices for other health items were as follows: physicians' fees, 45.2 per cent;

Table 4 • Percentage change in proportion of health dollar spent for specified items of health care, 1950 to 1960 and 1935 to 1960

Item	1950 to 1960	1935 to 1960
Dentists	− 8.2	−23.5
Physicians	− 9.4	−21.0
Other professional services	−18.2	−31.8
Drug preparations and sundries	+ 1.0	− 3.9
Ophthalmic products and orthopedic appliances	+12.7	+ 8.8
Privately controlled hospitals and sanitariums	+12.9	+47.8
Medical care and hospitalization insurance	+ 8.3	+90.2

Source: Calculated by Bureau of Economic Research and Statistics from data in Table 2.

Table 5 • Price indexes for items of "medical care," and Consumer Price Index, 1935-1960 (1947-1949 = 100)

Item	1960	1959	1958	1957	1956	1955	1954	1953	1952	1951	1950	1940	1935
Dentists' fees	137.3	134.6	131.4	127.4	124.4	122.0	120.9	117.0	113.3	110.9	106.9	70.1	68.2
Fillings	136.9	134.1	130.8	126.6	123.6	121.2	120.4	116.9	113.2	110.3	106.8	70.4	67.6
Extractions	140.0	137.7	135.0	131.6	128.4	126.1	124.0	118.1	113.8	112.5	107.3	68.9	67.4
Physicians' fees	145.2	141.6	137.0	132.5	127.0	123.3	119.2	115.8	112.8	108.0	104.1	74.6	73.8
General practitioners' fees	147.8	144.2	139.3	134.5	128.4	124.3	119.9	116.1	113.0	108.0	104.0	74.7	73.9
Office visit	143.5	140.8	136.3	131.4	127.1	123.7	120.4	115.8	111.9	107.5	103.8	73.9	73.3
House visit	147.9	143.5	138.2	133.1	125.3	120.7	115.9	113.5	111.0	107.7	104.3	78.0	77.2
Obstetrical care	161.7	158.3	153.8	149.8	144.5	139.8	131.2	125.4	122.7	110.9	104.2	67.1	65.5
Surgeons' fees	129.2	125.8	122.7	120.9	118.2	116.4	115.2	113.9	111.5	107.3	104.5	74.0	73.8
Appendectomy	124.7	122.3	120.1	119.6	117.6	115.2	114.9	114.0	112.0	107.4	104.2	76.1	75.4
Tonsillectomy	138.7	133.2	128.4	124.1	120.0	119.2	116.4	114.1	111.1	107.1	104.8	71.7	72.3
Optometric examination and eyeglasses	121.0	118.0	116.7	115.5	111.2	109.5	108.0	109.4	110.5	109.2	104.5	82.6	80.5
Hospital rates	223.3	208.9	198.0	187.3	173.3	164.4	156.8	148.2	139.5	126.9	114.6	50.4	47.1
Men's pay ward	244.1	229.0	215.6	202.3	183.8	173.9	164.4	155.1	145.3	131.2	117.2	46.0	42.7
Semi-private room	216.7	202.8	193.5	183.0	170.0	160.0	153.5	145.9	138.3	126.6	114.6	51.8	48.3
Private room	206.7	192.6	182.4	174.2	164.4	157.7	150.9	142.1	134.0	122.5	112.1	54.2	50.7
Prescriptions and drugs	122.8	122.6	120.7	116.7	113.7	111.2	110.1	108.9	107.9	106.9	103.9	83.2	83.0
Prescriptions	133.2	133.7	130.7	125.0	121.0	117.3	115.8	113.6	113.6	112.2	106.9	76.5	75.5
Aspirin tablets	109.1	109.1	108.0	102.3	100.7	100.0	98.6	99.8	99.5	99.4	99.9	97.9	98.0
Milk of magnesia	149.4	142.1	136.3	132.8	123.0	114.1	112.3	108.2	101.4	100.7	100.5	89.1	94.1
All "medical care"	156.2	150.8	144.6	138.0	132.6	128.0	125.2	121.3	117.2	111.1	106.0	72.7	71.4
Consumer Price Index	126.5	124.6	123.5	120.2	116.2	114.5	114.8	114.4	113.5	111.0	102.8	59.9	58.7

Source: Consumer Price Index, Price Indexes for Selected Items and Groups, Bureau of Labor Statistics, U.S Department of Labor.

Table 6 • Percentage increases in price indexes for items of "medical care" and for Consumer Price Index, for specified periods of time

Item	1955-1960	1950-1960	1935-1960
Dentists' fees	12.5	28.4	101.3
Fillings	13.0	28.2	102.5
Extractions	11.0	30.5	107.7
Physicians' fees	17.8	39.5	96.7
General practitioners' fees	18.9	42.1	100.0
Office visit	16.0	38.2	95.8
House visit	22.5	41.8	91.6
Obstetrical care	15.7	55.2	146.9
Surgeons' fees	11.0	23.6	75.1
Appendectomy	8.2	19.7	65.4
Tonsillectomy	16.4	32.3	91.8
Optometric examination and eyeglasses	10.5	15.8	50.3
Hospital rates	35.8	94.6	374.1
Men's pay ward	40.4	108.3	471.7
Semi-private room	35.4	89.1	348.7
Private room	31.1	84.4	307.7
Prescriptions and drugs	10.4	18.2	48.0
Prescriptions	13.6	24.6	76.4
Aspirin tablets	9.1	9.2	11.3
Milk of magnesia	30.9	48.7	58.8
All "medical care"	22.0	47.4	118.8
Consumer Price Index	10.5	23.1	115.5

Source: Calculated by Bureau of Economic Research and Statistics from data in Table 5.

Table 7 • Expenditures and price index for dental care and a measure of the relative amount of dental service received per capita, 1935-1960

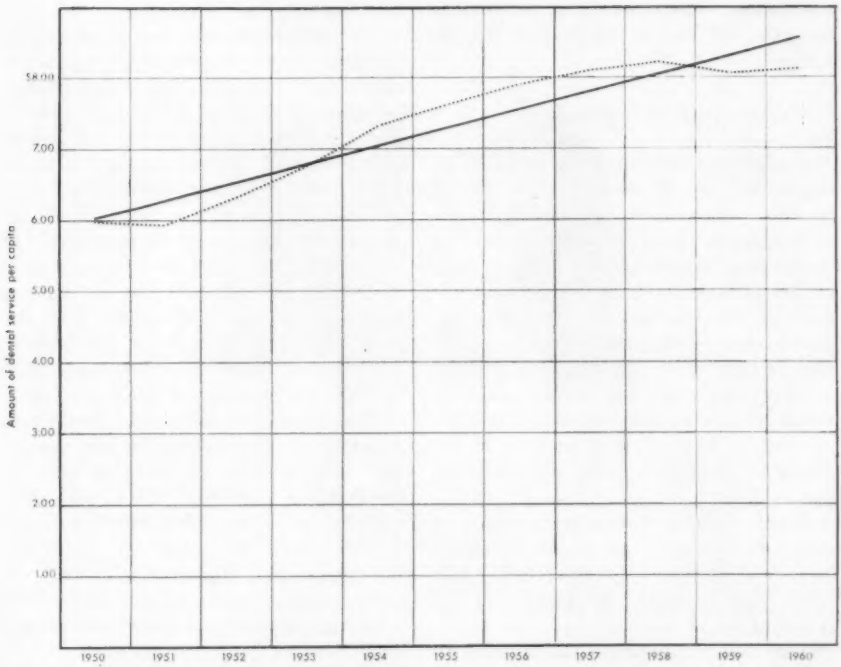
Year	Estimated civilian population, July 1	Consumer expenditures for dental care (millions of dollars)	(A) Per capita expenditures for dental care	(B) Dental care price index	Amount of dental service per capita: (A) ÷ (B)/100
1960	178,163,000	1,992	$11.18	137.3	$8.14
1959	174,724,000	1,894	10.84	134.6	8.05
1958	171,426,000	1,850	10.79	131.4	8.21
1957	168,370,000	1,737	10.32	127.4	8.10
1956	165,341,000	1,625	9.83	124.4	7.90
1955	162,306,000	1,508	9.29	122.0	7.61
1954	159,086,000	1,406	8.84	120.9	7.31
1953	156,046,000	1,234	7.91	117.0	6.76
1952	153,366,000	1,098	7.16	113.3	6.32
1951	151,082,000	997	6.60	110.9	5.95
1950	150,202,000	961	6.40	106.9	5.99
1940	131,658,000	419	3.18	70.1	4.54
1935	127,099,000	302	2.38	68.2	3.49

Sources: Population figures are from Current Population Reports, Series P-25, Bureau of the Census, U.S. Department of Commerce. Estimates of consumer expenditures for dental care are from the following publications of the Office of Business Economics, U.S. Department of Commerce: National Income, 1954 edition; U.S. Income and Output (1958), and Survey of Current Business, July 1961. Dental care price indexes are from Consumer Price Index, Price Indexes for Selected Items and Groups, Bureau of Labor Statistics, U.S. Department of Labor.

Table 8 • Consumer expenditures for selected items, 1960

Item	Amount (millions of dollars)	Per cent of total consumer expenditures
Tobacco products	7,493	2.28
Alcoholic beverages	9,860	3.00
Recreation	19,408	5.90
Radio and television receivers, records, and musical instruments	3,609	1.10
Admissions to spectator amusements	2,041	.62
Pari-mutuel net receipts	505	.15
Personal care	5,248	1.60
Toilet articles and preparations	2,890	.88
Barbershops, beauty parlors, and baths	2,358	.72
Jewelry and watches	2,136	.65
User-operated transportation	37,248	11.32
New cars and net purchases of used cars	15,800	4.80
Gasoline and oil	11,613	3.53
Health care	19,723	6.00
Physicians	4,960	1.51
Dentists	1,992	.61
Hospitals and sanitariums	5,195	1.58

Source: Survey of Current Business, July 1961, Office of Business Economics, U.S. Department of Commerce.



Amount of dental service per capita, 1950-1960 (per capita expenditures divided by price index) and straight trend line fitted by method of least squares

optometric examination and eyeglasses, 21.0 per cent; hospital rates, 123.3 per cent, and prescriptions and drugs, 22.8 per cent. The increase for all "medical care" (including dental care) was 56.2 per cent. The increase in the Consumer Price Index (all items) was 26.5 per cent.

Although dentists' fees have increased more rapidly than prices generally since the base period currently used in the Consumer Price Index, 1947-1949, prior to that time dentists' fees increased relatively slowly. From 1935 to 1960, the Consumer Price Index increased 115.5 per cent, compared to only 101.3 per cent for dentists' fees and 96.7 per cent for physicians' fees (Table 6). Moreover, between 1955 and 1960 the increase in dentists' fees (12.5 per cent) was only slightly greater than the increase in the Consumer Price Index (10.5 per cent). Obviously, the fastest increase in dentists' fees was between the base period, 1947-1949, and the mid-1950's. The rise in fees during this period undoubtedly was a "delayed reaction" to the rapid increase in other prices that took place during the latter part of the 1940's.

The Consumer Price Index is based on prices of some 300 items considered to be closely representative of all goods and services bought by the families of urban wage earners and clerical workers. Two of these items are one-surface amalgam fillings and simple extractions. Currently the Department of Labor is studying the buying practices of the population with a view to revising the list of articles priced and the weights accorded each item included in the Consumer Price Index. It is

anticipated that more than two dental services will be included after the revision.

AMOUNT OF DENTAL CARE

Per capita expenditures for dental care increased from $2.38 in 1935 to $11.18 in 1960 (Table 7). This difference resulted partly from an increase in fees and partly from an increase in the amount of dental care received per person. The part of the increase in per capita expenditures resulting from increase in fees may be removed by dividing expenditures by the price index for dental care. The result of this division, shown in the last column of Table 7, is a measure of the relative amount of dental care received per capita.

From 1935 to 1960, the amount of dental care received per capita increased, as measured by the dollar of 1947-1949, from $3.49 to $8.14—an increase of 133 per cent.

The annual amount of dental care received per person during the period 1950-1960 is shown on the graph. To define the trend, a straight line has been fitted by the method of "least squares." (The slope of the line is such that the sum of the squares of differences between the original data and the fitted line is a minimum.) The formula for the least squares line is $Y = 6.03 + .2554X$, with Y denoting amount of dental care per capita and X plus 1950 denoting the year.

The graph demonstrates a substantial increase in per capita consumption of dental care during the last decade. Extrapolation on the basis of the least squares line indicates that the amount of dental care received per person, in terms of 1947-1949 dollars, will increase to $11.14 in 1970 and to $12.41 in 1975. If the population increases, as predicted, to 235,200,000 in 1975, and if per capita consumption of dental care increases as indicated by the least squares line, the total amount of dental care provided in 1975 will be double the amount provided in 1960 (an increase of 101.2 per cent).

The measure of amount of dental care provides a basis for estimating the change in productivity of dentists. In terms of the dollar of 1947-1949, the average dentist in private practice in 1950 produced $11,986 worth of dental care. In 1960, the comparable figure was $17,069. In other words, the average dentist in 1960 produced 42 per cent more dental care than the average dentist in 1950.

OTHER EXPENDITURES

Table 8 compares expenditures for dental care with certain other expenditures. In 1960 the American people spent 4.9 times as much for alcoholic beverages, and 3.8 times as much for tobacco, as for dental care. Expenditures for recreation were about equal to expenditures for health.

Association staff members: your national servants

Benjamin F. Miller

Warren G. Ball

ACTING SECRETARY, COUNCIL ON DENTAL EDUCATION

In 1957 Ben F. Miller III was appointed to the Association staff as assistant secretary of the Council on Dental Education. Mr. Miller has been assigned staff responsibility for the Council's programs for auxiliary personnel. His staff assignments have also included preparation of recruitment materials used by the Association, supervision of an extensive list of Council publications and program responsibility for the Congress on Dental Education and Licensure, as well as other Council sponsored conferences. In June 1961 Mr. Miller was appointed acting secretary of the Council until a permanent secretary is selected.

Mr. Miller received a bachelor's degree in 1938 from Allegheny College and a master's degree in 1940 from the State University of Iowa. He taught freshman english at the State University of Iowa as a graduate assistant and business english at Allegheny College. During World War II he was an instructor in Army administration at The Adjutant General's School. He formerly owned and operated a retail coal, building supply and concrete business in Meadville, Pa.

ASSISTANT SECRETARY, COUNCIL ON DENTAL EDUCATION

Warren G. Ball joined the Association staff in 1958 as assistant secretary of the Council on Dental Education. He is concerned chiefly with hospital educational programs for dental interns and dental residents.

Dr. Ball attended Northwestern and Yale universities as an undergraduate, and received a dental degree from Northwestern University Dental School in 1947. He earned a master's degree in hospital administration from the University of Chicago School of Business.

Dr. Ball came to Chicago from the Palo Alto-Stanford Hospital Center in Palo Alto, Calif., where he served as assistant administrator. Previously, he was administrative assistant of the Highland-Alameda County Hospital in Oakland, Calif., and also served on the staff of the Zoller Memorial Dental Clinic at the University of Chicago and the Strong-Carter Dental Clinic in Honolulu.

Dr. Ball is married and the father of four children.

DIRECTOR, DIVISION OF CHEMISTRY

John J. Hefferren joined the Association staff in 1959 as director of the Division of Chemistry, a branch of the Council on Dental Therapeutics. The primary function of the division is to investigate the chemical aspects of dental drugs and their dosage forms, and to provide the Council with this information to aid it in its evaluation program. The division also engages in research activities of a more general nature.

A graduate of Loyola University, Chicago, Dr. Hefferren earned his M.S. and Ph.D. degrees in pharmaceutical chemistry and biochemistry at the University of Wisconsin.

He came to the Association after six years with the Chemistry Laboratory of the American Medical Association. He is a member of the American Chemical Society, American Pharmaceutical Association and the New

John J. Hefferren

York Academy of Sciences. From 1950 to 1953 he was a Fellow of the American Foundation for Pharmaceutical Education. He is a member of Sigma Xi, Rho Chi, Phi Sigma and Lambda Chi Sigma.

Dr. Hefferren is the author of many papers in the field of analytical, organic and pharmaceutical chemistry. One of the studies he presently is engaged in is the study of the stability and metabolism of dental local anesthetics. Such information may be useful in relating the mechanism and rate of detoxification, the duration of action and the anticipated toxicity of various local anesthetic compounds used in dentistry.

Leland C. Hendershot

ASSISTANT SECRETARY, COUNCIL ON DENTAL THERAPEUTICS

Leland Clifford Hendershot joined the Association staff in 1959 as assistant secretary of the Council on Dental Therapeutics.

Born in Detroit in 1924, he attended elementary and high schools in that city, went to Wayne University, Detroit, in 1942, and served in the U.S. Army from 1943 to 1946. He resumed his studies in 1946, at the University of Michigan, receiving a B.S. degree in 1948, a Ph.D. degree in pharmacology in 1955, and a D.D.S. degree in 1953. He served as research assistant and research associate at the University of Michigan from 1949 to 1955, and in the latter year was a lecturer in pharmacology. From 1955 to 1959 Dr. Hendershot was a pharmacologist with the Dow Chemical Co., Midland, Mich.

He is a member of the American Society for Pharmacology and Experimental Therapeutics, and the International Association for Dental Research. He is the author or co-author of 16 papers in the fields of therapeutics, pharmacology, physiology, biochemistry and dental research.

Dr. Hendershot is married and the father of ten children.

Daryl I. Miller

DIRECTOR, BUREAU OF AUDIOVISUAL SERVICE

Daryl I. Miller joined the staff of the Association in 1961 as film librarian, in charge of the Association's audiovisual education program and its extensive film library. It is the responsibility of the Bureau (1) to develop and maintain the film library, and (2) to foster the use and production of audiovisual materials of interest to the dental profession.

Born in Lake City, Iowa, Mr. Miller studied architectural engineering at Iowa State College. He studied office administration at the American Institute of Business in Des Moines, and business administration at Northwestern University, Chicago.

In World War II he served as a pharmacist mate with the Navy in the South Pacific.

From 1947 to 1955, Mr. Miller was production director for medical motion pictures at Mervin W. LaRue, Inc., Chicago. From 1956 to 1961 he was assistant director of motion pictures and medical television for the American Medical Association, and for two years served as arrangements manager in the convention services department of that association.

DIRECTOR, DEPARTMENT OF ADVERTISING AND EXHIBITS

John J. Hollister was appointed business manager of the Association in 1943. He continued in that post until 1957 when he was appointed director of the Association's Department of Advertising and Exhibits. He is responsible for the sale and management of advertising space in the Association's publications, and for the sale and supervision of commercial exhibit space at the annual sessions of the Association.

From 1930 to 1943 Mr. Hollister served as executive secretary of the Chicago Dental Society. He graduated from the University of Wisconsin in 1925 with the degree of Bachelor of Arts.

John J. Hollister

Mr. Hollister has served as vice-president of the Professional Convention Management Association. In 1959 he received an award of merit from the American College of Dentists for his contribution to the profession of dentistry.

Mr. Hollister is married and the father of two daughters.

SECRETARY, COUNCIL ON HOSPITAL DENTAL SERVICE

Gerard J. Casey joined the Association staff in 1950 as assistant secretary of the Council on Dental Education. In 1952 he was appointed secretary of the Council on Hospital Dental Service, and from 1952 to 1960 he also served as secretary of the Council of the National Board of Dental Examiners.

After graduating in 1937 from the Chicago College of Dental Surgery, Loyola University, Dr. Casey practiced dentistry in Chicago for five years before joining the Army Dental Corps as a captain in 1942. He served four years in the Army, and then became associate professor of dental therapeutics and dentistry for children, at Loyola University.

Gerard J. Casey

As secretary of the Council on Hospital Dental Service, Dr. Casey examines dental departments of hospitals and issues certificates of approval in the name of the American Dental Association to hospitals having dental departments which meet the basic standards approved by the Association's House of Delegates. He also acts on behalf of the Association in the investigation and improvement of dental facilities in hospitals. By 1961, about 36 per cent of the nation's 6,500 hospitals maintained an active dental service. The Council also serves as liaison to other organizations interested in health services. These organizations include the American Hospital Association, American Medical Association, and the Joint Commission on the Accreditation of Hospitals.

Dr. Casey is married and has one daughter.

SECRETARY, COUNCIL ON FEDERAL DENTAL SERVICES, COUNCIL ON INSURANCE

Herbert C. Lassiter joined the Association staff in 1957 as secretary of two Councils—the Council on Federal Dental Services and the Council on Insurance. The first-named Council serves as the Association's liaison with the major federal agencies which employ dentists to staff the various dental care programs, including the dental corps of the Air Force, Army and Navy, U.S. Public Health Service and the Veterans Administration. The Council on Federal Dental Services reviews the professional aspects of existing federal dental programs and formulates plans to increase the efficiency of such programs. A simultaneous duty of the Council is the formulation of programs for the participation of dentists in civil defense.

The Council on Insurance studies programs for insuring the members of the Association.

Herbert C. Lassiter

and makes recommendations regarding such programs.

Mr. Lassiter served with the SeaBees after World War II, and participated at Bikini in preparations for the first Bikini Atoll atomic bomb tests. After his graduation in 1951 from the Loyola University (Chicago) Law School, he engaged in the practice of law. In 1955 and 1956 he was with the Chicago law firm of McNamara, Voigt, Greene and Nordstand.

SECRETARY, COUNCIL ON DENTAL TRADE AND LABORATORY RELATIONS

John P. Noone joined the staff of the Association in October 1960 as secretary of the Council on Dental Trade and Laboratory Relations. Mr. Noone also serves as House Counsel of the Association.

A native of Chicago, Mr. Noone attended Loyola University and received his LL.B. degree in 1950 from Loyola Law School. In 1941 he enlisted in the infantry of the U.S. Army and served to June 1945; 37 months of this period were spent overseas, chiefly in New Guinea and the Philippine Islands.

Since his admission to the bar in 1950, Mr. Noone served as associate attorney with the law firm of Heineke and Conklin. He was contract, real estate and trial attorney for the North Central Division of the U.S. Army Corps of Engineers, and later was general attorney for Beatrice Foods Co.

Mr. Noone is a member of the Chicago Bar Association and the Chicago Association of Corporate Attorneys. He is a member of the Knights of Columbus, Holy Name Society, St. Ita Fathers Club, Art Institute of Chicago, Delta Theta Phi and Pi Gamma Mu. He is married and the father of three children.

John P. Noone

Mrs. Grace Parkin

SECRETARY, COUNCIL, NATIONAL BOARD OF DENTAL EXAMINERS

Mrs. Grace Parkin joined the Association staff in 1956 as director of the Division of Educational Measurements. In 1960 she was appointed secretary of the Council of National Board of Dental Examiners. The Council was established in 1948 to carry on the duties of the National Board of Dental Examiners in conducting national examinations (exclusive of clinical or practical demonstrations) in the art and science of dentistry. The Council conducts its examinations twice annually.

Mrs. Parkin was born in Pittsburgh and brought up in Champaign, Ill. She received an A.A. degree in 1942 from Blackburn College, Carlinville, Ill.; a B.A. with honors in 1943 from the University of Illinois, and a B.S. in engineering in 1944 from the University of Illinois.

After graduation Mrs. Parkin served as an instructor of mathematics and physics in the engineering training department of Pratt & Whitney in East Hartford, Conn.; from 1946 to 1956 she was employed by the American Maize Products Co., Roby, Ind., serving successively as research librarian, personnel counselor and employment manager.

She is married to John I. Parkin, syndicate manager of Cruttenden, Podesta and Company.

book reviews

NOYES' ORAL HISTOLOGY AND EMBRYOLOGY

By Isaac Schour. Eighth edition. 440 pages with 345 illustrations, 12 in color. Index. $11.50. Philadelphia, Lea & Febiger, 1960.

This new edition of a well known American textbook is an improvement over the previous edition (1953). Doctor Schour has added the indelible imprint of his meticulous care and sound judgment. In his preface the author acknowledges the advice and consultative help of a number of authorities, who, in a variety of special fields, have served to make the text authentic. The mere fact that this book is now appearing in its eighth edition attests to its value, and to the great interest which the field elicits.

In the preparation of this edition, the original plan of Dr. Frederick B. Noyes, now retired, to keep the book a simple and straightforward statement of current conceptions of the structure and functions of the tissues has been followed.

The text covers a rapidly expanding field, and has been improved through revision without being unduly lengthened. Some important changes have been made. Three color plates and 40 new figures and illustrations were added to replace old illustrations and to demonstrate new findings. Six tables were prepared to increase the clarity of the text. Another innovation is the addition of chapters on the histology of the temporomandibular joint and experimental dental histology. These new chapters contain the bulk of what the student needs to know in these areas. In addition to the excellent illustrations and list of up-to-date references that follow each chapter, the book is well indexed. All these features constitute a valuable contribution to this work. This new edition earns high praise. It sets forth the broad outlines of current oral histological and embryological knowledge.

This book can be recommended to dental and medical students, and graduate students in the various biological sciences as an excellent textbook and reference work on oral histology and embryology. In fact anyone interested in these subjects should possess a copy. For the student just being introduced to these subjects, an up-to-date readable text is a real boon.

The format, printing and illustrations in this book are excellent. The book is worthy of the fine tradition of the publishers.

E. Alan Lieban

HANDLEXIKON DER ZAHNÄRZTLICHEN PRAXIS (ENCYCLOPEDIA FOR THE DENTAL PRACTICE)

Edited by Herbert Harnisch and Joachim Gabka. Two volumes. 1,360 pages with 1,244 illustrations and 912 tables. Index. DM. 248. Stuttgart, Medica, 1960.

This dental encyclopedia, which seems to be the first of its kind, is based on contributions of 84 members of the health professions from seven European countries. The list of contributors—unique in an encyclopedic work—reveals the authoritative character of the scientists responsible for the text, terminology and definitions in their highly specialized fields.

The many years that the editors, both German dental educators, have devoted to the development of this work have called attention to the lexicographic problems. These problems as yet have prevented American writers and publishers from producing a work containing a comprehensive summary of dental and related knowledge.

Although mainly designed as a reference book for German dentists, this work offers information and entertaining reading for American dental practitioners and students who know the German language and are acquainted with the vocabulary of dentistry used in Europe. The chapters of interest to the American reader such as "Development, anatomy and physiology of the oral cavity," "Dental and oral diseases," "Oral surgery," "Prosthodontics," "Orthodontics," "Relation between dentistry and medical specialties such as internal medicine, otorhinolaryngology, dermatology, neurology, psychiatry, psychology and general surgery," "Dental roentgenology," "Dental pharmacology," and "First aid at the dental office," are divided into almost 1,000 topics arranged in alphabetical order.

It is essential, however, that the reader study not only these topics but that he read the excellent introductory paragraphs of each chapter, because these provide keys to valuable information and explanations in regard to the anatomy, physiology, pathology, diagnostic and prognostic possibilities of the treatment methods described.

This encyclopedia would also be a good book to keep at the dental office where patients could read it, because it is both entertaining and accurate, and would give them an understanding of the time, trouble, work and expense which have gone into every dentist's education and practice.

Paul H. Glucksman

DENTAL PRACTICE ADMINISTRATION

By Robert K. Stinaff. 264 pages with 44 illustrations. Index. $7.50. St. Louis, C. V. Mosby Co., 1960.

This new and attractive book is a welcome addition to the all-important field of dental practice administration. The author emphasizes the present difficulties of teaching dental students all the essentials of practice administration during the regular dental curriculum. The student graduates—always with the basic training in the science of dentistry—failing to relate his professional knowledge with the logical progression of dentist-patient relationships.

The author relates in the 21 well-written chapters his concept of practice administration, including information on making a choice—private practice, military service, public health service, teaching, and so forth.

There are chapters devoted to the practice goal, planning in the office, equipment for the office (with methods of financing), necessary tools, becoming known, auxiliary personnel, appointment control, office procedures for handling patients, fees, payment plans and collections, case presentation and motivation, communications, how to gain and lose patients, lay education, office and personal business involvements, continuing education and affiliation, growth of the practice and philosophy, ethics and jurisprudence, facing the facts, and valuable information concerning literature recommended for reading by the recent graduate as well as the seasoned practitioner.

Of major value is the language used throughout the text which is objective, understandable and accurate. The illustrations supplement the text material.

Considerable new material has been added which former books on the subject of practice administration have failed to provide.

This book undoubtedly will enjoy wide circulation because it is valuable equally to the recent graduate and long time practitioner. Its comprehensiveness will be helpful to the professional, social and financial career of the dentist.

Lloyd H. Dodd

INTERNAL MEDICINE IN DENTAL PRACTICE

By Leon H. Collins, Jr., and Martin D. Crane. Fifth edition. 555 pages with 94 illustrations and 6 colored plates. Index. $8.50. Philadelphia, Lea & Febiger, 1960.

This book has become a classic for the education of dentists in preparation for their modern role as physicians specializing in diseases of the oral region. It is written by practicing internists with a wealth of clinical experience and a background of adapting this material to meet the needs of students and practitioners of dentistry. Every dentist could use it to advantage as a reference in problems where the responsibility of the dental and medical professions overlap.

The book is divided into 14 parts. The first five parts are concerned with diseases of the major systems: heart and blood vessels, respiratory, gastrointestinal, kidney and urinary tracts, and the nervous system. In all instances there is a competent section dealing with dental aspects of the particular system. Following sections are concerned with endocrinology, diseases of the blood and blood-forming organs with a section on the relation of diseases of the blood to dentistry, arthritis and allied conditions.

The infections are considered in part 9. Bacillary diseases, coccal infections, fungal, viral, spirochetal and rickettsial diseases are discussed briefly. There are also sections on diseases due to protozoa and metazoa.

Part 10 is concerned with diseases of the eye, nose, pharynx, mouth, salivary glands and ear. Part 11 discusses allergy and deficiency diseases with a brief consideration of nutrition and nutritional disorders and a more detailed presentation of the vitamins, including their source, structure and functions and the clinical signs and symptoms of their lack.

Part 12 takes up chemical poisoning and intoxication with a section on dental considerations and part 13 is concerned with foci of infection. The authors take a conservative, middle-of-the-road attitude in discussing foci of infection, holding that unquestioned areas of infection should be removed but warning that "one must not expect miracles; long standing contracture and deformities will not vanish overnight after the removal of infected tonsils or the extraction of teeth with extensive periapical abscesses."

Part 14 is concerned with sulfonamides, antibiotics and tuberculostatic drugs. There is a section on the use of sulfonamides in dentistry and a table on precautionary measures during sulfonamide therapy.

An appendix presents normal laboratory values of clinical importance. These include blood chemical constituents, clinical examinations and functional tests. Normal values are also given for urine, cerebrospinal fluid and certain miscellaneous tests including basal metabolic rate, circulation time and respiratory quotient for burning fat, protein, carbohydrate, and under basal conditions.

Recent and appropriate publications are listed in the references at the end of each part. This book is highly recommended to all students of dentistry who wish to keep abreast of modern concepts in diagnosis and therapy.

Paul E. Boyle

VERÄNDERUNGEN DER ZUNGE IN DER DIAGNOSTIK DES PRAKTISCHEN ARZTES (CHANGES OCCURRING IN THE TONGUE AS DIAGNOSTIC SYMPTOMS FOR THE PRACTITIONER)

By Hans Jacoby. 156 pages with 55 illustrations. Index. DM. 21. Stuttgart, Friedrich Karl Schattauer, 1960.

The author attempts to present the morphology and physiology of the tongue in a book containing only 156 pages, of which 26 pages are used for prefaces, summaries, references and the index. It is not surprising, therefore, that the book fails in rendering a useful service for the medical or dental practitioner in regard to the important part the symptomatology of the tongue plays in diagnosis.

Although the book contains excellent illustrations (51 in color), the pathologic changes in the tongue suggesting the presence of cardiac, hepatic and malignant diseases are dealt with too briefly. Because of many omissions, especially in regard to the diagnosis of oral diseases, the book cannot be recommended for dental students or practitioners.

Paul H. Glucksman

DIAGNOSTIC STOMATOLOGY

By E. Cheraskin, M.D., D.M.D. 338 pages with numerous illustrations. Index. $12.50. New York, The Blakiston Division, McGraw-Hill Company, Inc., 1961.

In his preface Dr. Cheraskin states "The use of information derived from an examination of blood, urine and saliva has never truly joined the diagnostic armamentarium of the stomatologist."

In the brief scope of 338 pages the author presents a concise view of the field of diagnostic stomatology in practically all of its aspects. Here are the basic facts one might need. The book has excellent general medical and dental application. It is useful and informative. It presents a new approach by applying clinical pathologic studies to oral medicine. The subject matter is well organized, clearly written and contains a wealth of clinical photography and charts.

The text is divided into 12 chapters. 1. Nature of oral disease. 2. Normal laboratory values. 3. Physiology and pathology of blood. 4. Physiology and pathology of urine. 5. Physiology and pathology of saliva. 6. Tests for detection of infection. 7. Tests for detection of chemical intoxication. 8. Tests for detection of neoplasia. 9. Tests for detection of hormonal imbalance. 10. Tests for detection of nutritional disturbances. 11. Tests for detection of stress disorders. 12. Tests for detection of hemorrhagic diathesis.

Each chapter is concluded with a summary, followed by ample references to medical and dental authors of the past and present. These acknowledgments include a brief of the related article of each author. To facilitate the motif, an author's index is also appended. The subject index is extensive and extremely well organized.

This is an outstanding work that should be invaluable to the dental and medical student, intern and practitioner. The binding and format are in good taste, the paper and print of high quality.

E. Alan Lieban

GENERAL ANESTHESIA FOR DENTISTRY

By James McNaught Inglis and Victor Campkin. 88 pages. Index. $3. Baltimore, Williams & Wilkins Co., 1960.

This is a brief textbook on dental anesthesia obviously intended only as an introduction to the subject. It stresses the basic use of nitrous oxide as the dental anesthetic of choice, with the underlying theme that deprivation of oxygen to an extent which results in the appearance of cyanosis is unnecessary. Throughout the text, the authors reiterate the importance of balanced anesthesia, one in which multiple drugs are utilized to obtain narcosis, analgesia and relaxation. Each component of this anesthetic requirement is produced by a specific agent, and to a degree adequate for the purpose of the anesthetic.

The ten short chapters give a fairly complete consideration of the total subject. Starting with chapters on the pharmacology and physiology of anesthesia, the material includes superficial discussions of patient preparation, duties of the anesthetist, some practical consideration of technics, the use of intravenous and other agents, hazards, and the management of children. The chapter dealing with "endotracheal technics" is so limited that its inclusion is hardly justified.

Although the authors state the intentional avoidance of an attempt to produce a "do-it-yourself" publication, the cursory presentation of the subject material does not compensate for the deficiency of the text. The student may not glean sufficient information to provide comprehension, and it is unlikely that any practitioner of general anesthesia could significantly improve his anesthesia acumen by reading this book.

Herbert J. Bloom

MEDICAL X-RAY PROTECTION UP TO THREE MILLION VOLTS

National Bureau of Standards Handbook 76. 52 pages. 4 figures, 11 tables. 25c. Washington, D. C., National Bureau of Standards, 1961.

A few years ago, the National Committee on Radiation Protection and Measurements revised downward its recommended maximum permissible exposure to man. Many of the tables contained in the familiar *Handbook 60* were rendered obsolete by this revision, thus the need for the present handbook was created.

Some of the portions of *Handbook 76* that deal with dentistry are new, others are improved over the contents of *Handbook 60*, while others items are less useful than before.

A method for measuring leakage radiation has been specified which takes into account for the first time the duty cycle of the dental apparatus. This is a desirable addition to the handbook because there has been confusion in the past regarding this point.

Another useful addition has been the specification that the size of the useful roentgen-ray beam at the end of the cone shall be no greater than three inches in diameter.

A target-to-skin distance of not less than seven inches must now be maintained with equipment operating above 50 KvP, and four inches with apparatus operating at 50 KvP or below. It would be interesting to learn on what basis the magical distance of seven inches was chosen. Of the four major brands of dental x-ray equipment, only two meet this requirement, and if the distance requirement were set one-eighth inch higher, only one of these two brands would meet the new requirement.

The shielding requirements listed in the tables are for very unrealistic workloads and are of little value to the dentist who exposes 50 to 150 packets per week. For example, with the tube operated at 70 KvP, 10 Ma, and with a distance of five feet between the tube and the occupied area, shielding requirements are listed for a workload of 4800 one-second exposures per week. A dentist would have to expose two film packets every minute for eight hours a day and for five days a week before he would equal the stated workload. At 100 KvP the dentist would have to expose 15,000 films per week at 0.4 second per film to equal the workload the shielding is designed for.

The answers to most of our problems regarding roentgenology in dentistry are to be found in *Handbook 76*, but they are well concealed in certain instances.

Albert G. Richards

THE STORY OF X-RAYS, FROM RÖNTGEN TO ISOTOPES

By Alan Ralph Bleich. 186 pages with 54 illustrations. Paperbound. Index and glossary. $1.50. New York, Dover Publications Inc., 1960.

The author tells the story of the discovery of roentgen rays and the development of their various applications in medicine and industry. In nontechnical language, he gives many interesting examples of the use of roentgenology in diagnosis and therapy. The discussions of industrial applications are well chosen.

Being in story form, it is not intended as a textbook, but makes interesting light reading.

Robert J. Nelsen

BASIC PERIODONTOLOGY

By A. Bryan Wade. 303 pages with 233 illustrations. Index. $10. Baltimore, Williams & Wilkins Co., 1960.

A new textbook in such a well-covered field as periodontology requires some justification. This small volume merits commendation, however, since it treats the subject in a rather unique manner. In the preface the author states: "Both undergraduate and postgraduate students have lacked a suitable book to explain the fundamental facts without which most clinical experience is wasted. . . . This book has been written to correct this deficiency, and is based on the undergraduate course and successive postgraduate courses given to general practitioners at the School of Dental Surgery of the Royal Dental Hospital of London."

Knowledge of periodontal tissues depends on a biological approach to dentistry. Throughout the text, accent has been laid on this factor. Wherever histological study assists in understanding the clinical picture it has been included. For these reasons the plan of the book is somewhat different from other textbooks on periodontology, dealing with other phases of dentistry.

The book is divided into three parts—health, disease and prevention. In writing the section on health, an attempt has been made to obtain a more dynamic appreciation of the periodontal tissues. A comprehension of a part in a state of health is essential before studying in detail the diseases to which it may be subject. Any study of the diseases affecting an organ is facilitated by grouping conditions which are really variations of a basic pathological change. Prevention may be regarded either as the maintenance of health or the prevention of disease. Many methods of prevention can be appreciated fully only after the causes of disease processes are determined. Much attention has been given to the problems of diagnosis, since correct diagnosis forms the basis of successful treatment. Treatment itself has been described in two ways: First, the details of specific items of treatment; second, the application of these in the treatment of the different diseases. This has been done so that the technics of treatment can be mastered first, and then applied in an intelligent manner to the management of diseases.

Although the text is thoroughly indexed, all references have been omitted. A few names of prominent authors are mentioned in the preface. The text is well illustrated. Microphotographs, roentgenographic, photographic reproductions and line drawings show excellent details. The writing is clear and very informative. On the whole, Dr. Wade's book should prove useful as a functional approach to periodontic procedures, and a view of how they cope with its major problems.

Students and general practitioners should find this compact textbook a worthwhile guide to the diagnosis and treatment of periodontal conditions. It brings together the basic observations and clinical effects, and presents the practical aspects of their application.

E. Alan Lieban

SYNOPSIS OF ORAL PATHOLOGY

By S. N. Bhaskar, D.D.S., Ph.D. 502 pages with illustrations. Index. $9.75. St. Louis, C. V. Mosby Co., 1961.

Any disease which involves an organ must, in the last analysis, produce some effect on the body as a whole. Life is a constant battle between an organism and its environment. The functions of inflammation are to mobilize all the defenses of the body and to bring them to the site of battle with the purpose of overwhelming the source of injury. The ability of all living things to repair themselves is a prerequisite for survival. Dr. Bhaskar's discussion of inflammation and regeneration and repair is very well done.

Definitive diagnosis of pathological lesions is established by microscopic and other laboratory procedures, but a clinician must have a general knowledge of all oral diseases. Oral pathology has been presented in this book in a manner that is meaningful to the clinician. The lesions are classified according to their clinical appearance, and information that will aid the clinician in making a rational assessment of the lesion is furnished.

The pathology of the oral region is presented in tabular form under several different headings such as: lesion, location, sex, features, treatment, and prognosis. Following this, the general principles of oral pathology as they apply to categories of teeth and jaws, of oral mucosa and tongue, of salivary glands, and special oral pathology are covered with enough detail to make this book very handy for reference purposes.

The classification of the lesions of the oral mucous membranes, the illustrations, and the style of writing, all lend themselves to the positive proposition that this is a very fine book. It is well-written, and, since it is a synopsis, actually short but direct and to the point. It is a good book and should be of interest to all dentists.

Marvin Sniderman

100-ÅRSJUBILEET SVENSKA TANDLÄKARE SÄLLSKAPET, 1860-1960 (HUNDREDTH ANNIVERSARY OF THE SWEDISH DENTAL ASSOCIATION, 1860-1960)

Edited by Göte Nyquist. 105 pages with 51 illustrations. Swed.crowns 15. Stockholm, Svensk Tandläkare Tidskrift, 1960.

This book, celebrating the hundredth anniversary of the Swedish Dental Association, was published as a special issue of *Svensk Tandläkare Tidskrift,* the official journal of the association. The substance of the text is taken from the proceedings of the 100th annual session, held at Stockholm from August 17 to 20, 1960.

This collection of papers, read before an international audience, shows the progress achieved in all fields of Swedish dentistry, especially in oral surgery, orthodontics, pedodontics, periodontics, prosthodontics, public health dentistry and dental education. This book makes such fascinating reading that even those dentists who are not particularly interested in the history of Scandinavian dentistry or the organization of the dental profession in Sweden will derive instruction and profit from studying the contributions of outstanding men who are active in research directly or indirectly related to dentistry.

While a knowledge of the Swedish language is necessary for full appreciation, the illustrations are sufficiently graphic that complete conversance with this language is not necessary to profit from this excellent book.

Paul H. Glucksman

DENTISTRY FOR THE PRESCHOOL CHILD

By G. N. Davies and Richard M. King. 268 pages with 51 illustrations. Index. $7.50. Baltimore, Williams & Wilkins Co., 1961.

The authors of this book are presently associated with the University of Otago Dental School, Dunedin, New Zealand. They recognized the need for a more detailed book dealing with the specific dental problems of the very young child and proceeded to do a very creditable job of fulfilling this need.

There are 15 chapters, written in a very concise manner, and each chapter has a very fine bibliography. The chapters are well written and cover fairly adequately the information necessary to care properly for the preschool child. The various chapters cover examination and diagnosis, management of the child, diet and nutrition, lesions and infections of the soft tissues, anomalies, interceptive orthodontics, injuries to the deciduous teeth, control and prevention of dental caries, morphology of the deciduous dentition, cavity preparation and pulp therapy.

The expressed hope of the authors, in writing this book, is to stimulate practitioners to take a greater interest in the dental problems of the very young child. This book should fulfill that hope. It is recommended to all practitioners of dentistry as a practical and useful addition to their library.

William W. Demeritt

PRACTICAL ORTHODONTICS

By George M. Anderson, D.D.S. Ninth edition. 738 pages with 719 illustrations. Index. $18. St. Louis, C. V. Mosby Co., 1960.

Practical Orthodontics starts with an introduction to orthodontics and ends with treatment aids and procedures.

This book was planned to give a comprehensive view of orthodontic methods and aids not always available, because of time limitations, to graduate students and to the preceptee who may be practicing in an office in which technical procedures are limited to a single method.

Along with the additional information included in the ninth edition is a skeletal classification of malocclusion; a discussion of muscular functional disharmonies; the utilization of serial extraction, and the use of removable plates and the mechanics of light wire forces.

Also, since the previous edition was published, there has been continued expansion in research and knowledge relating to etiology and diagnosis, and this is true especially concerning genetic influences and the understanding of developmental aberrations.

The pedodontist or the general practitioner of dentistry especially interested in the care of the child patient will find guidance in the prevention of malocclusion in the ninth edition of *Practical Orthodontics.* *William F. Ford*

THE JAWS AND TEETH OF PRIMATES

By W. Warwick James. 328 pages with illustrations. $21. London, Pitman Medical Publishing Co., 1960.

Any teacher interested in comparative anatomy of the masticatory organs will greet this book with enthusiasm. Practically all genera of primates are illustrated in excellent photographs showing the entire skull and the separated cranium and mandible. Each photograph

carries a scale so that visualization of actual size is almost forced on the reader. The precision of the short legends under each photograph is remarkable. Of greatest help, however, are the short remarks on feeding and general living habits of each illustrated form, and the longer, but still succinct, remarks preceding the presentation of each family or subfamily. The book is a mine of information for student and teacher alike. It should be a must for the library of any dental school.

Harry Sicher

THE NEW YORK ACADEMY OF DENTISTRY—ITS FIRST THIRTY-FIVE YEARS

By Edgar S. Bacon, D.D.S. 237 pages. Index. Price $10. New York, The New York Academy of Dentistry, 1960.

This volume is an invaluable reference source of information about The New York Academy of Dentistry. Dr. Bacon has consolidated his account of events since the Academy's founding, from available data supplied by records and some of its members. In his introduction, he states, "This is the story of The New York Academy of Dentistry. It is not a chronology of organizational activities, but rather a restatement of the philosophy of dentistry as promulgated by its founders and practiced by its members; the philosophy of professionalism measured in terms of highest ethical standards." The editor has applied himself well to the task he has undertaken. He has prepared authoritative information which provides the subject's fundamental background, as well as presenting recent important advances.

The text, divided into 17 chapters, portrays the Academy's growth, its activities and achievements as well as its contributing influence toward the advancement of dentistry during the first 35 year period of the Academy's existence, which dates from February, 1921 until April, 1956. Elective officers and committees are completely enumerated through 1960. Supplementing the body of the work is a comprehensive account of each meeting, including the essayists and their titled subjects; also a complete listing of active, associate, allied, nonresident, retired fellows and honorary fellows, and a detailed index which points to specific items. Thus a complete historical continuity is preserved, and at the same time quick reference to individual events is made possible. Altogether, the text is written in a story-like style, easy to read and concise in relation to the material discussed. The approach is logical and orderly, indicating care and foresight.

The book makes interesting reading. It represents extensive investigation. Dr. Bacon merits commendation for the excellent job he has done in putting the material together with coherent form.

E. Alan Lieban

A MANUAL OF PRACTICAL ORTHODONTICS

By W. J. Tulley and A. C. Campbell. 220 pages with 237 illustrations. Index. $8.75. Bristol, England. John Wright & Sons Ltd., 1960.

This book is designed to meet the requirements of undergraduates and to act as a basis for general reading for postgraduates.

In the chapters on treatment the accent is almost entirely on removable appliances, as the authors feel that, with a very few exceptions, satisfactory results can be obtained in this way. Emphasis is placed on simplicity of appliance design and only one or two ways of effecting various tooth movements are described.

In a volume of this size it is impossible to cover all of the aspects of the subject and the reader is referred to the bibliography for more detailed studies.

William F. Ford

LEITFADEN ZAHNAERZTLICHER WERKSTOFFE UND IHRER VERARBEITUNG (GUIDE TO DENTAL MATERIALS AND THEIR APPLICATION)

By Karl Eichner. Index. 337 pages with 242 illustrations and 24 tables. $5. Berlin. Berlinische Verlagsanstalt, 1960.

This textbook contains six sections which will give the reader an up-to-date perception of the field of dental materials. It is primarily intended for the dental student, the dental practitioner and the dental technician.

The book distinguishes itself from many other books on the same subject in that it attempts to meet, above all, the demands of the dental practitioner when describing the properties and manipulations of the various materials. This is particularly evident in the chapters dealing with denture clasps, corrosion of dental alloys and materials used for root canal fillings.

The chapters on polishing and corrosion of metals are more informative than is commonly found in American literature. On the other hand, the description of impression materials does not supply an adequate understanding of the properties of these products.

Most of the chapters are presented in a very concise and clearly written manner. Points are substantiated by easily understandable data and adequate references at the end of each chapter.

The illustrations are excellent and follow each other in such a fashion as to make it possible for a person who is not acquainted with the German language to grasp the highlights of the book's content.

Joseph Rubinstein

NEW AND NONOFFICIAL DRUGS (NND)

By the Council on Drugs, American Medical Association. 878 pages. Index. $4. Philadelphia, J. B. Lippincott Co., 1961.

NND is an annual publication in which relatively new drugs are described. Stress is placed on clinically useful effects, toxicity, contraindications and dosage. Drugs are routinely omitted from *NND* after they have been on the market in the United States for 20 years.

The information in *NND* is of a very high order of reliability. The book is always well edited and easy to read. The paper and typography are good and the low price makes ownership of each annual edition relatively painless.

The major portion of the book consists of descriptions of drugs. Twelve descriptive monographs which were in the 1960 edition have been omitted, and 55 new monographs have been added. Many new sedatives, tranquilizers and synthetic skeletal muscle relaxants are included for the first time, as well as a number of autonomic drugs and glucocorticoids.

There has been less than the usual amount of revision of monographs carried over from the previous edition, but some descriptions have been changed extensively.

The section of the 1961 edition devoted to the organization and policies of the Council on Drugs reveals that the membership of the Council has undergone considerable change during the past year, and that its policies and procedures have been revised significantly. It is not clear what effect these changes will have on future editions of *NND*.

Donald A. Wallace

DENTAL CLINICS OF NORTH AMERICA—

November 1960 issue. Three issues published yearly, March, July and November. Total price $14 yearly subscription. Philadelphia, W. B. Saunders Co., 1960.

SYMPOSIUM ON CONTROVERSIES IN DENTISTRY

By Sumter S. Arnim, D.D.S., Ph.D. Consulting editor in collaboration with 44 co-authors. 358 pages with some illustrations. Index of authors, 1960, and cumulative index, 1958-60.

In his foreword the consulting editor states that the intention in organizing this unusual symposium was to present opposing viewpoints on unresolved questions in such diverse fields as prosthodontics, operative dentistry, periodontics, oral medicine, roentgenology and orthodontics. The purpose, in addition to setting forth these arguments themselves, was to show that honest differences of opinion do exist among knowledgeable men, and that unresolved problems—some of them old and familiar, some new and freshly challenging—remain to confront us with tests of our skill in application of the scientific method, and to motivate us toward further progress in science.

Forty-four authors participated in the writing of 20 chapters. Each contributor was chosen for his familiarity with the topic he was asked to write about. In spite of the number of collaborators and the inevitable differences of points of view inherent in such a situation, the book has a remarkable unity of style and approach that often is lacking in volumes to which so many authors have contributed.

The book represents a tremendous amount of work and thought. It has an extensive bibliography which appears to be up-to-date. The index is adequate. The format, like previous ones in this series, is well-conceived. The illustrations are clear and informative. The book was written primarily with the practicing dentist in mind. The contents are so lucidly presented and so well organized that it should be read by all concerned with modern concepts of dental practice.

E. Alan Lieban

A PRACTICAL SYSTEM OF ORTHODONTICS

By Egon Neustadt. 816 pages with 419 illustrations. Index. $28.50. New York, Fairfield Press, 1960.

In the introduction the author states that "the purpose of this book is to prepare the dentist for the practice of orthodontics. To the general practitioner this may seem a difficult goal to attain; it can, however, be accomplished provided the dentist is willing to study carefully and completely the system presented here. The reason for this requirement lies in the fact that a series of new concepts have been developed and other generally accepted theories have had to be discarded."

The major portion of the book represents lectures, clinical sessions and courses of instruction that have been taught at the Dewey School of Orthodontics for "more than 10 years."

The so-called new concepts that the author describes are wordy, complicated and for the most part out-dated. He does not believe in the extraction of any teeth, other than the third molars, in the treatment of malocclusion. He states that "the grave disturbances in dental health and function far out-weigh any esthetic improvements that might conceivably be achieved by extraction." He states further that there is "no scientific foundation for any of Tweed's postulates."

In the entire book only five pages are devoted to the discussion of cephalometrics. The author does not use cephalometric analysis in his practice.

Three pages in the book are devoted to extraoral anchorage and appliances. The author feels that extraoral appliances are cumbersome and awkward and that it is often difficult to obtain the patient's acceptance of them. Further, he feels that the reciprocal mesial movement of the mandibular arch, using Class II elastics, is the correct way to handle the treatment of a Class II Division 1 malocclusion.

The occlusion is painstakingly discussed from a static point of view, with no emphasis placed on such important subjects as dynamic or functional analysis or physiological rest position.

Appliance discussion is limited to the author's own conception of an undermechanized labiolingual technic.

It is difficult to understand why the author has discarded the generally accepted theories and methods that are taught at the majority of our leading universities.

This book can hardly be recommended reading to one who is a serious student of orthodontics.

William F. Ford

MINOR TOOTH MOVEMENT IN GENERAL PRACTICE

By Leonard Hirschfeld. 332 pages with 293 illustrations. Index. $12. St. Louis, The C. V. Mosby Co., 1960.

Some discussion of minor tooth movement is often included in textbooks in the fields of orthodontics and periodontics, and there is much information on this subject in the dental periodical literature, but now for the first time, we have an organized, comprehensive source devoted mainly to providing the general practitioner with the background he needs in order to put the technics of minor tooth movement into practical use.

The main indications for minor tooth movement are divided into five categories: esthetic purposes, prosthetic purposes, periodontal purposes, procedural purposes, and interception of malocclusion. Certainly a diastema between two anterior teeth is probably the malposition that confronts dentists most frequently, and is the one correction that is most dramatic to the patient. This book demonstrates how to correct this type of deformity.

Dr. Hirschfeld lists six prerequisites for attempting minor tooth movement: there must be sufficient room between adjacent teeth; occlusal interferences must be eliminated; the axial inclinations of the tooth to be moved must be favorable so that it can be tipped; etiologic factors must be correctable unless permanent retention is contemplated; periodontal and periapical prognosis must be good, and favorable psychologic conditions should be present.

There is a very comprehensive discussion of selection of instances; the methods of obtaining anchorage; the response of the periodontium during movement; the laboratory technics required; management of situations; specific movement in mesial, distal, labial, and lingual directions; depression and extrusion of teeth, and retention. The chapter on the problem of the deep overbite is especially worthy of study. All general practitioners are confronted with this condition.

There are nearly 300 line drawings and 275 photographs that show method. These illustrate in minute detail a great deal that supplements more than adequately the written material.

Dr. Hirschfeld has presented a well-organized, easily-readable study that is clear, concise, and is not only of value as a reference book but can be studied with ease. All general practitioners, orthodontists and periodontists would find it of value. This book is an important contribution to the dental literature.

Marvin Sniderman

BUREAU OF MEMBERSHIP RECORDS

Abbott, John R., West Point, Miss.; Northwestern University Dental School, 1939; died April 25, 1961; age 45.

Ache, John B., Uniontown, Pa.; Pittsburgh Dental College Western University of Pennsylvania, 1906; died April 14, 1961; age 78.

Adams, James F., Redwood City, Calif.; St. Louis University School of Dentistry, 1916; died June 16, 1961; age 80.

Adams, William C., Portland, Ore.; University of Denver School of Dentistry, 1905; died June 26, 1961; age 87.

Addes, Michael W., Palm Springs, Calif.; University of Illinois College of Dentistry, 1925; died March 13, 1961; age 65.

Alexander, Albert C., Kahoka, Mo.; Washington University School of Dentistry, 1898; died March 21, 1961; age 87.

Alexander, Martin T., Boston; Harvard Dental School, 1920; died February 13, 1961; age 66.

Allen, Thomas R., Minneapolis; Chicago College of Dental Surgery, 1917; died February 1, 1961; age 71.

Allison, James M., Atlanta, Ga.; Atlanta-Southern Dental College, 1924; died May 18, 1961; age 60.

Allred, Leo W., Dallas, Texas; Baylor University College of Dentistry, 1935; died February 19, 1961; age 56.

Amyot, Pierre A., Schenectady, N. Y.; Philadelphia Dental College, 1902; died June 26, 1961; age 80.

Anderson, Bert G., New Haven, Conn.; University of Minnesota School of Dentistry, 1914; died June 15, 1961; age 72.

Anderson, Harvey A., Decatur, Ga.; Drake University College of Dentistry, 1913; died March 16, 1961; age 68.

Anderson, Subbeal S., New York; Howard University College of Dentistry, 1923; died February 19, 1961; age 65.

Apple, Arthur D., Cleveland; Western Reserve University School of Dentistry, 1899; died February 24, 1961; age 85.

Applegate, Howard T., Larchmont, N. Y.; New York College of Dentistry, 1919; died May 15, 1961; age 64.

Aramaki, Henry M., San Pedro, Calif.; Tufts College Dental School, 1945; died June 9, 1961; age 41.

Arganbright, Ned A., Freeport, Ill.; Northwestern University Dental School, 1915; died March 8, 1961; age 67.

Ashton, John T., Alexandria, Va.; Georgetown University School of Dentistry, 1911; died May 22, 1961; age 74.

Avis, Jake, Jr., Austin, Texas; University of Texas School of Dentistry, 1951; died February 21, 1961; age 38.

Aznavorian, Kevork S., Lancaster, Pa.; Medico-Chirurgical College of Philadelphia, 1914; died May 23, 1961; age 73.

Bailey, Jerome A., Wynne, Ark.; University of Tennessee College of Dentistry, 1950; died February 23, 1961; age 37.

Bailey, Warren W., Petersburg, Alaska; North Pacific College of Oregon School of Dentistry, 1942; died May 1, 1961; age 52.

Bailie, Thomas E., Los Angeles; Northwestern University Dental School, 1915; died March 30, 1961; age 69.

Baish, William H., Baltimore; Baltimore College of Dental Surgery, University of Maryland, 1909; died March 21, 1961; age 88.

Baker, William P., Louisville, Ky.; Kansas City Dental College, 1891; died May 20, 1961; age 94.

Balderson, George A., Minatare, Neb.; Creighton University School of Dentistry, 1913; died February 27, 1961; age 69.

Baldwin, Francis K., Endicott, N. Y.; University of Pennsylvania School of Dentistry, 1928; died February 5, 1961; age 58.

Baldwin, Robert A., Henderson, Ky.; Louisville College of Dentistry, 1905; died May 29, 1961; age 80.

Ballina, Dario F., Baton Rouge, La.; Tulane University School of Dentistry, 1917; died May 21, 1961; age 70.

Barns, Cassius M., Albion, Pa.; Pennsylvania Dental College, 1898; died April 2, 1961; age 84.

Barr, William C., Washington, D.C.; Columbian University Dental Department, 1902; died March 31, 1961; age 85.

Bawden, Arthur C., Mount Carroll, Ill.; University of Illinois College of Dentistry, 1902; died May 9, 1961; age 85.

Beal, Morley J., Lakewood, N. Y.; Western Reserve University School of Dentistry, 1897; died April 17, 1961; age 87.

Belber, Jesse M., Warren, Ohio; Pennsylvania College of Dental Surgery, 1904; died May 25, 1961; age 75.

Belden, Roy P., Seward, Neb.; Omaha Dental College, 1903; died May 20, 1961; age 82.

Bell, Junius J., Macon, Ga.; Meharry Medical College School of Dentistry, 1909; died February 25, 1961; age 76.

Bennett, John G., Hendersonville, N. C.; Atlanta Dental College, 1919; died May 31, 1961; age 68.

Bennion, William E., Jr., Salt Lake City; University of Southern California School of Dentistry, 1946; died February 12, 1961; age 46.

Berg, Stanley H., Yorkville, Ill.; Northwestern University Dental School, 1923; died March 13, 1961; age 65.

Berger, Adolph, New York; New York College of Dentistry, 1909; died April 14, 1961; age 78.

Berk, John W., Reading, Pa.; University of Pennsylvania School of Dentistry, 1925; died February 15, 1961; age 57.

Berryman, William L., Amboy, Ill.; University of Illinois College of Dentistry, 1904; died March 7, 1961; age 85.

Beverly, Frank S., Highland Park, Mich.; University of Michigan School of Dentistry, 1928; died January 10, 1961; age 61.

Bevier, Foster W., Bear Lake, Mich.; University of Michigan School of Dentistry, 1924; died March 29, 1961; age 64.

Bierk, Lee A., St. Louis; St. Louis University School of Dentistry, 1918; died December 10, 1960; age 64.

Bish, Harley L., Johnson City, Tenn.; Indiana Dental College, 1910; died April 20, 1961; age 81.

Bishton, William H., Jr., Aliquippa, Pa.; University of Pittsburgh School of Dentistry, 1935; died May 25, 1961; age 55.

Bleeg, Frederick G., Portland, Ore.; North Pacific College of Oregon School of Dentistry, 1913; died March 22, 1961; age 71.

Boeck, Walter O., Chicago; Chicago College of Dental Surgery, 1922; died February 28, 1961; age 63.

Boll, George A., Yonkers, N. Y.; College of Dental and Oral Surgery, 1911; died April 26, 1961; age 71.

Bolton, Ernest U., Louisville, Ky.; University of Louisville School of Dentistry, 1928; died June 13, 1961; age 56.

Bong, J. Norman, Minneapolis; University of Minnesota School of Dentistry, 1925; died May 29, 1961; age 58.

Bovik, A. Roley, Tinley Park, Ill.; Northwestern University Dental School, 1906; died June 22, 1961; age 78.

Bow, John M., Iron River, Mich.; Northwestern University Dental School, 1908; died June 11, 1961; age 78.

Bowman, Fred H., Milwaukee; Louisville College of Dentistry, 1908; died December 30, 1960; age 73.

Boyers, Charles E., Lewisburg, W. Va.; University of Louisville School of Dentistry, 1927; died February 6, 1961; age 57.

Boyle, Harold N., Reading, Mass.; Harvard Dental School, 1899; died May 24, 1961; age 84.

Boynton, George E., Ocean Park, Maine; Philadelphia Dental College, 1890; died March 4, 1961; age 93.

Braithwaite, Oswald B., Memphis, Tenn.; Meharry Medical College School of Dentistry, 1911; died February 13, 1961; age 77.

Braly, Albert C., Carmel, Calif.; Vanderbilt University School of Dentistry, 1908; died March 19, 1961; age 78.

Brandt, Paul B., Augusta, Kan., Kansas City-Western Dental College, 1929; died March 1, 1961; age 63.

Bright, Jacob B., Bremerton, Wash.; North Pacific College of Oregon School of Dentistry, 1919; died February 18, 1961; age 64.

Brooks, Chappell T., Columbia, S. C.; Southern Dental College, 1910; died March 29, 1961; age 71.

Brown, Alvin J., Milwaukee; Milwaukee Medical College Dental Department, 1901; died March 19, 1961; age 79.

Brown, Merritt E., Wells, Vt.; University of Pennsylvania School of Dentistry, 1913; died February 19, 1961; age 70.

Brown, Peter A., Atchison, Kan.; Kansas City-Western Dental College, 1921; died March 14, 1961; age 61.

Brown, Roy H., Egg Harbor, N. J.; University of Pennsylvania School of Dentistry, 1918; died April 25, 1961; age 68.

Brucher, Walter J., Le Mars, Iowa; University of Iowa College of Dentistry, 1919; died February 8, 1961; age 64.

Buehler, John E., Le Mars, Iowa; University of Minnesota School of Dentistry, 1917; died February 28, 1961; age 70.

Buhrman, Roy A., Ocean City, Md.; University of Maryland, Dental Department, 1909; died February 19, 1961; age 81.

Bunch, Edward C., Kansas City, Mo.; Ohio Medical University College of Dentistry, 1905; died March 19, 1961; age 80.

Burke, Mark M., Boston; Tufts College Dental School, 1918; died April 21, 1961; age 64.

Burke, Samuel E., Los Angeles; Chicago College of Dental Surgery, 1896; died February 14, 1961; age 93.

Burt, Charles E., Los Angeles; University of Pennsylvania School of Dentistry, 1897; died June 2, 1961; age 84.

Bush, Clayton F., Rochester, N. Y.; University of Buffalo School of Dentistry, 1922; died May 3, 1961; age 64.

Butler, Harry P., Fort Thomas, Ky.; Cincinnati College of Dental Surgery, 1906; died April 20, 1961; age 80.

Butler, Lucius A., Baltimore; Howard University College of Dentistry, 1915; died March 28, 1961; age 69.

Byrnes, Hugh E., Waterbury, Conn.; Baltimore College of Dental Surgery, University of Maryland, 1915; died April 20, 1961; age 73.

Callaway, John S., Beckley, W. Va.; Baltimore College of Dental Surgery, University of Maryland, 1941; died March 5, 1961; age 44.

Cameron, Finlay G., Naches, Wash.; Marquette University School of Dentistry, 1925; died April 21, 1961; age 63.

Campbell, Charles D., Atlanta, Ga.; Atlanta-Southern Dental College, 1940; died February 18, 1961; age 47.

Carlstead, Edward R., Webb City, Mo.; St. Louis University School of Dentistry, 1913; died December 23, 1960; age 78.

Carnes, Raymond H., Richmond, Ind.; Indiana Dental College, 1913; died February 16, 1961; age 70.

Carpenter, James L., Marietta, Ga.; Atlanta-Southern Dental College, 1933; died March 8, 1961; age 54.

Carson, William P., Ambridge, Pa.; University of Pittsburgh School of Dentistry, 1911; died April 17, 1961; age 77.

Carter, Henry A., Evanston, Ill.; Indiana Dental College, 1924; died February 24, 1961; age 66.

Castillo, Samuel, Kingston, N. Y.; Philadelphia Dental College, 1907; died February 20, 1961; age 78.

Cawthon, Louis F., DeFuniak Springs, Fla.; Vanderbilt University School of Dentistry, 1899; died January 7, 1961; age 87.

Cayton, Alfred M., Steilacoom, Wash.; Kansas City-Western Dental College, 1929; died May 14, 1961; age 56.

Chandra, Krishna, Sacramento, Calif.; College of Physicians and Surgeons, School of Dentistry, 1932; died February 20, 1961; age 55.

Christy, Donald L., Brownsburg, Ind.; Indiana University School of Dentistry, 1959; died March 27, 1961; age 28.

Clarkson, Luther A., Farmington, N. H.; University of Maryland, Dental Department, 1917; died April 18, 1961; age 75.

Cobb, Ernest F., Springfield, Mo.; Meharry Medical College School of Dentistry, 1922; died February 13, 1961; age 68.

Coble, Lucian G., Greensboro, N. C.; Baltimore College of Dental Surgery, University of Maryland, 1908; died June 19, 1961; age 73.

Coburn, Harold A., Portsmouth, Ohio; University of Pittsburgh School of Dentistry, 1925; died March 12, 1961; age 61.

Cohen, Samuel M., New York; College of Dental and Oral Surgery, 1919; died March 24, 1961; age 64.

Cohn, Max A., Cleveland, Texas; Texas Dental College, 1914; died March 7, 1961; age 72.

Cole, William L., Pittsburgh; University of Pittsburgh School of Dentistry, 1924; died April 11, 1961; age 65.

Collins, Thomas J., Seminole, Okla.; Kansas City Dental College, 1905; died December 12, 1960; age 78.

Collins, Thomas M., Joliet, Ill.; University of Illinois College of Dentistry, 1911; died April 9, 1961; age 73.

Converse, Albert E., Springfield, Ill.; University of Illinois College of Dentistry, 1904; died March 14, 1961; age 80.

Conway, Joseph J., Madison, Fla.; Southern Dental College, 1902; died March 11, 1961; age 83.

Cooper, Edgar P., Patton, Pa.; University of Pittsburgh School of Dentistry, 1923; died March 31, 1961; age 66.

Cooper, Samuel C., Highland Park, N. J.; Georgetown University School of Dentistry, 1936; died March 25, 1961; age 48.

Cooper, Samuel E., Alamogordo, N. Mex.; Atlanta Dental College, 1911; died June 19, 1961; age 75.

Copeland, Edmund, Jonesville, Mich.; University of Minnesota School of Dentistry, 1925; died February 13, 1961; age 65.

Cotter, William J., Westfield, Mass.; Temple

University School of Dentistry, 1910; died March 30, 1961; age 75.

Courtice, Oliver J., Cedar Lake, Ind.; Northwestern University Dental School, 1907; died June 7, 1961; age 80.

Courtney, Edward W., La Jolla, Calif.; University of Minnesota School of Dentistry, 1937; died May 2, 1961; age 53.

Coward, Allen C., Dallas, Texas; Baylor University College of Dentistry, 1919; died March 14, 1961; age 64.

Cox, Julius E., Warrior, Ala.; Atlanta Dental College, 1927; died February 19, 1961; age 65.

Crockett, William J., Columbus, Ga.; University of Louisville School of Dentistry, 1901; died March 17, 1961; age 79.

Crouch, Rolla O., Maroa, Ill.; Chicago College of Dental Surgery, 1902; died March 17, 1961; age 80.

Crowley, Daniel J., West Newton, Mass.; Tufts College Dental School, 1912; died April 25, 1961; age 72.

Cummings, Edwin, Newark, N. J.; University of Maryland, Dental Department, 1923; died June 11, 1961; age 66.

Cundiff, Craig J., Kansas City, Mo.; Kansas City Dental College, 1918; died May 8, 1961; age 64.

Curry, Homer L., Bloomington, Ind.; Indiana Dental College, 1907; died February 27, 1961; age 79.

Curry, John C., West Chester, Pa.; Philadelphia Dental College, 1887; died April 18, 1961; age 93.

Dale, Harry M., Cambridge Springs, Pa.; died May 29, 1961; age 65.

Danz, Paul E., St. Paul; University of Minnesota School of Dentistry, 1916; died March 22, 1961; age 66.

Davis, Ammon M., Newberg, Ore.; North Pacific College of Oregon School of Dentistry, 1906; died May 12, 1961; age 83.

Davis, Frederick G., Philadelphia; Medico-Chirurgical College of Philadelphia, 1898; died March 4, 1961; age 84.

Davis, Homer R., Kansas City, Mo.; Western Dental College, 1918; died October 27, 1960; age 74.

Deist, Milzor W., Chicago; University of Illinois College of Dentistry, 1915; died April 9, 1961; age 69.

DeLong, George F., Reading, Pa.; University of Pennsylvania School of Dentistry, 1903; died May 8, 1961; age 78.

Dement, Robert L., Atlanta, Ga.; Atlanta Dental College, 1916; died June 15, 1961; age 73.

Dengler, Harry A., Detroit; University of Michigan School of Dentistry, 1923; died February 13, 1961; age 65.

Denham, Edwin W., Mesquite, Texas; Baylor University College of Dentistry, 1952; died February 17, 1961; age 36.

Deslandes, Leo E., Providence, R. I.; University of Maryland, Dental Department, 1926; died January 5, 1961; age 61.

DeVoe, John F., Elizabeth, N. J.; Philadelphia Dental College, 1908; died June 3, 1961; age 74.

Dierksen, William M., Worthington, Ohio; Ohio State University College of Dentistry, 1953; died June 15, 1961; age 34.

Dill, E. Millard, Franklin, Ind.; Indiana Dental College, 1918; died April 17, 1961; age 65.

Dingledine, Paul, Columbus, Ohio; Ohio State University College of Dentistry, 1921; died June 22, 1961; age 61.

Dominick, Martin L., Orlando, Fla.; Southern Dental College, 1911; died April 23, 1961; age 77.

Doty, John D., Daytona Beach, Fla.; Ohio Medical University College of Dentistry, 1901; died February 13, 1961; age 82.

Downey, William S., Ocean City, N. J.; University of Pennsylvania School of Dentistry, 1905; died April 21, 1961; age 79.

Doyle, William F., Reedsburg, Wis.; died December 31, 1960; age 86.

Dumbleton, Frank, Jr., Haddonfield, N. J.; University of Pennsylvania School of Dentistry, 1916; died June 10, 1961; age 66.

Dunning, William O., Middletown, N. Y.; Baltimore College of Dental Surgery, University of Maryland, 1898; died June 4, 1961; age 85.

Edwards, William P., Carthage, Miss.; Southern Dental College, 1910; died March 14, 1961; age 74.

Eggleston, Leon G., Antwerp, N. Y.; Pennsylvania College of Dental Surgery, 1905; died March 23, 1961; age 78.

Ellis, Carl E., Nashville, Tenn.; Vanderbilt University School of Dentistry, 1918; died June 6, 1961; age 68.

Ellison, Anthony E., Dallas, Texas; Northwestern University Dental School, 1913; died March 5, 1961; age 81.

Ellwanger, Gustavus J., Sunland, Calif.; Marion-Sims College of Medicine Dental Department, 1899; died March 19, 1961; age 86.

Engel, Arthur L., St. Louis; St. Louis University School of Dentistry, 1940; died March 20, 1961; age 43.

Erwin, Homer A., Hurricane, W. Va.; Ohio College of Dental Surgery, University of Cincinnati, 1915; died May 23, 1961; age 69.

Esser, Abraham S., New York; College of

Dental and Oral Surgery, 1919; died February 19, 1961; age 64.

Ettelson, Michael, Jamestown, N. Y.; Harvard Dental School, 1918; died March 20, 1961; age 69.

Evans, James A., Bay St. Louis, Miss.; New Orleans Dental College, 1905; died May 21, 1961; age 75.

Evans, William E., Reading, Pa.; University of Pennsylvania School of Dentistry, 1922; died April 3, 1961; age 61.

Faulkner, Charles A., Oakland, Calif.; College of Physicians and Surgeons, School of Dentistry, 1918; died April 1, 1961; age 79.

Faulkner, Frank J., Oswego, Kan.; Kansas City Dental College, 1916; died February 27, 1961; age 66.

Feldman, M. Hillel, New York; New York College of Dentistry, 1909; died March 1, 1961; age 72.

Ferguson, Stonewall J., Chicago; Washington University School of Dentistry, 1899; died April 6, 1961; age 82.

Fickes, Josiah B., Russellville, Ark.; University of Iowa College of Dentistry, 1898; died May 24, 1961; age 84.

Fielding, Richard S., Latham, N. Y.; University of Pennsylvania School of Dentistry, 1917; died April 2, 1961; age 68.

Fields, George W., Chicago; Meharry Medical College School of Dentistry, 1919; died May 7, 1961; age 73.

Finlayson, James B., Cleveland; Western Reserve University School of Dentistry, 1912; died March 1, 1961; age 72.

Fjelde, Joseph L., Clinton, Minn.; University of Minnesota School of Dentistry, 1931; died March 27, 1961; age 56.

Fosmo, Ferdinand W., Webster, Wis.; Marquette University School of Dentistry, 1923; died December 25, 1961; age 65.

Foster, Harry E., Paris, Ky.; Louisville College of Dentistry, 1908; died June 27, 1961; age 76.

Foster, John C., Opp, Ala.; Southern Dental College, 1905; died March 1, 1961; age 76.

Frachtman, Philip, Suffern, N. Y.; New York College of Dentistry, 1908; died June 21, 1961; age 73.

Freericks, Frank H., Louisville, Ky.; University of Louisville School of Dentistry, 1926; died February 14, 1961; age 64.

Fried, Irvin U., Milwaukee; University of Illinois College of Dentistry, 1912; died December 29, 1960; age 71.

Friedlander, Jacob S., New York; Columbia University School of Dental and Oral Surgery, 1924; died April 21, 1961; age 60.

Fritz, Joel R., Cranston, R. I.; Philadelphia Dental College, 1888; died June 7, 1961; age 99.

Fullerton, Richard M., Pompano Beach, Fla.; University of Illinois College of Dentistry, 1915; died February 27, 1961; age 68.

Gallimore, B. C., McKenzie, Tenn.; University of Tennessee College of Dentistry, 1913; died February 27, 1961; age 76.

Galster, Paul V., Erie, Pa.; University of Pittsburgh School of Dentistry, 1942; died February 17, 1961; age 49.

Gardner, Boyd S., Mission, Texas; University of Michigan School of Dentistry, 1903; died March 5, 1961; age 80.

Garrett, Linton O., Santa Anna, Texas; State Dental College, 1915; died March 16, 1961; age 76.

Gaston, Clifford G., Shelbyville, Ind.; Indiana Dental College, 1925; died March 5, 1961; age 63.

Gaule, George, Baldwin, N. Y.; Columbia University School of Dental and Oral Surgery, 1927; died March 30, 1961; age 58.

Gayle, John H., Los Angeles; died March 16, 1961; age 78.

Geller, John W., Indianapolis; Indiana University School of Dentistry, 1932; died June 25, 1961; age 54.

Gerner, David H., New Hyde Park, N. Y.; New York College of Dentistry, 1921; died January 1961; age 64.

Gibbons, Gerald M., New York; University of Buffalo School of Dentistry, 1959; died April 28, 1961; age 27.

Gilbert, Edward, Collinsville, Ill.; Marquette University School of Dentistry, 1916; died December 24, 1960; age 71.

Gilda, Julius E., Philadelphia; Temple University School of Dentistry, 1909; died May 8, 1961; age 75.

Gill, John G., Lebanon, Ore.; North Pacific College of Oregon School of Dentistry, 1905; died March 15, 1961; age 81.

Gillette, William L., Madison, Wis.; Chicago College of Dental Surgery, 1902; died May 16, 1961; age 92.

Gilley, Philip F. M., Southwest Harbor, Maine; University of Maryland, Dental Department, 1913; died April 28, 1961; age 73.

Glass, Clark H., Atlanta; Atlanta-Southern Dental College, 1919; died March 25, 1961; age 67.

Glenn, Theodore W., Cleveland; Western Reserve University School of Dentistry, 1939; died January 1, 1961; age 47.

Glover, Henry H., Americus, Ga.; Vanderbilt University School of Dentistry, 1897; died April 24, 1961; age 89.

Gober, Walter D., Brooklyn; College of Dental and Oral Surgery, 1917; died March 28, 1961; age 64.

Gold, Joseph K., Holyoke, Mass.; Tufts College Dental School, 1924; died May 5, 1961; age 60.

Goldfarb, Irving J., Baldwin, N. Y.; College of Dental and Oral Surgery, 1919; died March 17, 1961; age 65.

Goodson, Galen R., Beverly Hills, Calif.; University of Denver School of Dentistry, 1918; died March 11, 1961; age 69.

Grady, Anthony B., Fitchburg, Mass.; died May 7, 1961; age 78.

Greenberg, Harry D., New York; New York College of Dentistry, 1923; died April 3, 1961; age 62.

Greenslade, Ralph S., Stoneham, Mass.; Tufts College Dental School, 1940; died April 1, 1961; age 46.

Grempler, Herbert T., Catonsville, Md.; Baltimore College of Dental Surgery, University of Maryland, 1912; died November 24, 1960; age 69.

Grooby, Clyde D., Lancaster, Pa.; Temple University School of Dentistry, 1918; died February 9, 1961; age 67.

Grubb, Homer D., Cleveland; Ohio Medical University College of Dentistry, 1904; died June 11, 1961; age 78.

Gruss, Francis J., Menlo Park, Calif.; University of California College of Dentistry, 1899; died February 14, 1961; age 82.

Hall, John H., De Smet, S. D.; died March 13, 1961; age 94.

Hamlett, Horace I., Brooklyn; Howard University College of Dentistry, 1922; died March 26, 1961; age 61.

Hanawalt, Robert P., Dearborn, Mich.; University of Detroit School of Dentistry, 1955; died April 21, 1961; age 30.

Hansen, Clarence W., Chicago; University of Illinois College of Dentistry, 1929; died February 9, 1961; age 58.

Hanson, Abel A., Chicago; Chicago College of Dental Surgery, 1900; died April 5, 1961; age 88.

Harkins, Cloyd S., Osceola Mills, Pa.; University of Pennsylvania School of Dentistry, 1910; died March 22, 1961.

Harrell, William G., St. Louis; Washington University School of Dentistry, 1930; died March 20, 1961; age 60.

Harvey, Albert C., Knoxville, Tenn.; University of Tennessee College of Dentistry, 1937; died May 6, 1961; age 48.

Harvey, Leonard A., Pierre, S. D.; Northwestern University Dental School, 1926; died May 8, 1961; age 61.

Haworth, Dillen L., Martinsville, Ind.; Indiana Dental College, 1923; died April 3, 1961; age 60.

Heacox, Francis E., Britt, Iowa; Northwestern University Dental School, 1898; died February 8, 1961; age 87.

Heavrin, Oscar B., Owensboro, Ky.; Louisville College of Dentistry, 1901; died May 2, 1961; age 81.

Hemphill, William F., Omaha; Creighton University School of Dentistry, 1916; died May 7, 1961; age 68.

Henry, William M., Shreveport, La.; Southern Dental College, 1903; died May 16, 1961; age 78.

Heseman, Walter H., Washington, Mo.; Washington University School of Dentistry, 1918; died April 6, 1961; age 67.

Heurlin, Robert J., Chicago; Loyola University School of Dentistry, Chicago College of Dental Surgery, 1925; died April 26, 1961; age 60.

Hickey, James P., Saginaw, Mich.; Marquette University School of Dentistry, 1935; died June 3, 1961; age 49.

Hickey, Joseph A., Batavia, N. Y.; University of Buffalo School of Dentistry, 1927; died January 11, 1961; age 57.

Hile, Edward O., Loveland, Colo.; Keokuk Dental College, 1903; died February 12, 1961; age 87.

Hill, Lawrence S., Schenectady, N. Y.; University of Buffalo School of Dentistry, 1938; died March 15, 1961; age 50.

Hill, LeRoy E., Wayne, Pa.; Medico-Chirurgical College of Philadelphia, 1912; died March 9, 1961; age 70.

Hodgson, Francis H., Philadelphia; University of Pennsylvania School of Dentistry, 1905; died March 30, 1961; age 77.

Hogue, Herbert M., Playa Del Ray, Calif.; University of Pennsylvania School of Dentistry, 1917; died June 22, 1961; age 71.

Holden, Bertram F., Passaic, N. J.; Pennsylvania College of Dental Surgery, 1900; died March 6, 1961; age 84.

Holz, Carl W., Springfield, Ill.; Northwestern University Dental School, 1918; died June 8, 1961; age 72.

Hopkins, William F., New York; New York University College of Dentistry, 1917; died February 22, 1961; age 69.

Hoppman, Henry, Philadelphia; Pennsylvania College of Dental Surgery, 1898; died November 15, 1960; age 81.

Hordell, Seymour B., Rye, N. Y.; University of Louisville School of Dentistry, 1939; died April 7, 1961.

Horner, William W., New Castle, Pa.; University of Pittsburgh School of Dentistry, 1921; died January 29, 1961; age 63.

Howard, Joseph L., Winchester, Ky.; Ohio College of Dental Surgery, University of Cincinnati, 1913; died March 19, 1960; age 73.

Hunt, Jack M., Attleboro, Mass.; Tufts College Dental School, 1943; died February 14, 1961; age 47.

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MEETINGS OF THE AMERICAN DENTAL ASSOCIATION

One-Hundred and Third Annual Session	October 29-November 1, 1962	Miami Beach, Fla.
One-Hundred and Fourth Annual Session	October 14-17, 1963	Atlantic City, N.J.
One-Hundred and Fifth Annual Session	November 9-12, 1964	San Francisco
One-Hundred and Sixth Annual Session	November 8-11, 1965	Las Vegas, Nev.

MEETINGS OF CONSTITUENT SOCIETIES

State	*Date*	*Place*	*Secretary and Address*
Alabama	Apr. 14-18	Birmingham	C. R. Crook, Professional Center, Montgomery
Alaska	July 9-11	Fairbanks	G. O. Gould, Box 4-964, Spenard
Arizona	Apr. 25-28	Tucson	J. F. Vaughn, 2727 N. Central Ave., Phoenix
Arkansas	Apr. 8-11	Little Rock	D. M. Hamm, Box 89, Clarksville
California	Apr. 8-11	San Francisco	F. H. Romick, 518 Sutter St., San Francisco 2
S. California	Apr. 16-18	Los Angeles	C. D. Honig, 903 Crenshaw Blvd., Los Angeles 19
Colorado			G. H. Siersma, 903 Republic Bldg., Denver 2
Connecticut	May 16, 17	Hartford	E. S. Arnold, 37 Linnard Rd., W. Hartford
Delaware	June 8, 9	Wilmington	R. Tomases, 2105 Washington St., Wilmington
Dist. of Columbia	Mar. 4-7	Washington	B. D. Mattox, 1835 Eye St., N.W., Washington 6
Florida	May 13-16	Miami Beach	L. J. Atkins, 223 Hyde Park Ave., Tampa
Georgia			F. M. Butler, Jr., 307 Southern United Bldg., Macon
Hawaii	June 24-28	Honolulu	J. H. Dawe, 291 Alexander Young Bldg., Honolulu 13
Idaho			K. L. Gilbert, 508 N. Latah, Boise
Illinois	May 7-9	Springfield	P. W. Clopper, 632 Jefferson Bldg., Peoria
Indiana	May 20-23	Indianapolis	C. L. Howell, 1012 Hume Mansur Bldg., Indianapolis 4
Iowa	May 7-9	Des Moines	H. N. Hake, 639 Insurance Exchange Bldg., Des Moines 9
Kansas	May 6-9	Topeka	F. A. Richmond, Brotherhood Bldg., Kansas City 1
Kentucky	Apr. 1-4	Louisville	A. B. Coxwell, Jr., 2208 Dundee Rd., Louisville 5
Louisiana	May 9-12	Baton Rouge	J. S. Bernhard, 231 Atkins Ave., Shreveport 26
Maine	June 14-16	Rockland	S. M. Gower, 6 Coburn Ave., Skowhegan
Maryland	May 6-9	Baltimore	W. Schunick, 19 Medical Arts Bldg., Baltimore 1

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Michigan	Apr. 9-11	Grand Rapids	K. J. Ryan, 901 Welch Blvd., Flint
Minnesota	Apr. 2-4	St. Paul	C. V. E. Cassel, 2236 Marshall Ave., St. Paul 4W
Mississippi	June 17-20	Biloxi	M. C. O'Keefe, Medical Arts Bldg., Jackson 2
Missouri	Apr. 22-25	St. Louis	E. D. Suggett, 101 W. High St., Jefferson City
Montana	May 3-5	Billings	R. C. Ritter, 28 N. Black St., Bozeman
Nebraska	Apr. 30-May 2	Omaha	F. A. Pierson, Federal Securities Bldg., Lincoln
Nevada	June 17-19	Lake Tahoe	O. M. Seifert, 821 Ryland Ave., Reno
New Hampshire	June 17-19	Whitefield	F. E. Williams, 517 Milton St., Manchester
New Jersey	May 20-23	Atlantic City	J. G. Carr, 407 Cooper St., Camden 2
New Mexico	June 6-9	Santa Fe	E. P. Purtell, 2917 Santa Cruz Ave., S.E., Albuquerque
New York	May 6-10	Lake Kiamesha	C. A. Wilkie, 268 Ashland Pl., Brooklyn 17
North Carolina	May 6-9	Pinehurst	S. B. Towler, P.O. Box 11065, Raleigh
North Dakota			D. R. Perry, Box 866, Bismarck
Ohio	Nov. 5-8	Columbus	E. G. Jones, 185 E. State St., Columbus
Oklahoma	Apr. 8-11	Oklahoma City	W. C. Hopkins, 210 Plaza Court Bldg., Oklahoma City
Oregon	May 7-10	Portland	T. D. Holder, Selling Bldg., Portland
Panama C. Z.	May 26	Balboa	J. K. McDonald, P.O. Box 1417, Balboa
Pennsylvania	May 21-23	Wernersville	I. Sissman, 217 State St., Harrisburg
Puerto Rico			R. Gonzales R., Box 10452, Caparra Heights
Rhode Island	Jan. 14	Providence	E. Z. Radlo, 188 Main St., Pawtucket
South Carolina	June 3-6	Myrtle Beach	J. E. Wallace, 1506 Gregg St., Columbia
South Dakota	May 13-15	Yankton	R. E. Decker, 2909 Poplar Dr., Sioux Falls
Tennessee	May 6-10	Chattanooga	J. J. Vaughn, Jr., 210 23rd Ave., N., Nashville 5
Texas	Apr. 29-May 2	Dallas	C. A. McMurray, 3707 Gaston Ave., Dallas 10
Utah	May 24-26	Salt Lake City	R. C. Dalgleish, 1554 Princeton Ave., Salt Lake City 5
Vermont			E. C. Woods, 128 Merchants Row, Rutland
Virginia	Apr. 29-May 2	Richmond	M. E. Henderson, Shenandoah Bldg., Roanoke 11
Washington	June 24-28	Seattle	R. V. Tucker, 417 Grosvenor House, 500 Wall St., Seattle 1
West Virginia	July 29-Aug. 1	White Sulphur Springs	P. H. Loftin, 109½ E. Main St., Beckley
Wisconsin	Apr. 30-May 2	Milwaukee	C. J. Baumann, Jr., 704 W. Wisconsin Ave., Milwaukee
Wyoming	June	Worland	T. J. Drew, State Office Bldg., Cheyenne

MEETINGS OF STATE BOARDS OF DENTAL EXAMINERS

State	Date	Place	Secretary and Address
Alabama	June 24-30* June 25†	Birmingham	W. L. Smith, 524 Chestnut St., Gadsden
Alaska			J. E. Miller, 1000 Fireweed Lane, Anchorage
Arizona			R. K. Trueblood, 1611 N. Second Ave., Glendale
Arkansas	June 17-22*†	Little Rock	G. Cone, 113 S. Pecan St., Osceola
California	Jan. 29-Feb. 3 June 18-23 June 17 July 6-9 July 30-Aug. 4	Los Angeles Los Angeles Loma Linda San Francisco San Francisco	E. F. Furstman, 1021 O St., Rm. A-597, Sacramento 14
Colorado			J. E. Cummings, 903 Republic Bldg., Denver 2
Connecticut			M. J. Zazzaro, 99 Pratt St., Hartford 3
Delaware			J. F. Maguire, 1200 N. Van Buren St., Wilmington
Dist. of Columbia	Jan. 8-10	Washington	J. A. Madden, 1740 Massachusetts Ave., N.W., Washington 11

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State	Date	Place	Secretary and Address
Florida			R. P. Taylor, Jr., P.O. Box 2913, Jacksonville 3
Georgia	June 4-6*†‡		T. A. Boone, 401 Southern United Bldg., Macon
Hawaii			R. M. Gibson, Alexander Young Bldg., Honolulu
Idaho			W. M. Smith, 305 Fort St., Boise
Illinois			R. I. Humphrey, 185 N. Wabash Ave., Chicago
Indiana	Nov. 13-16*†	Indianapolis	C. A. Frech, Gary National Bank Bldg., Gary
Iowa	June 4-7‡ June 4, 6†‡		P. A. Hahn, Farmers & Merchants Bank Bldg., Burlington
Kansas	Jan. 22-24 June 4-6	Kansas City, Mo.	E. F. Cavin, 119 W. Eighth, La Crosse
Kentucky			F. W. Jordan, 2208 Dundee Rd., Louisville
Louisiana			A. R. deNux, 617 N. Monroe St., Marksville
Maine			A. H. Garcelon, 133 State St., Augusta
Maryland	Nov. 6-8	Baltimore	F. J. Bryce, 303 Granville Dr., Silver Spring
Massachusetts			R. R. Racicot, 33 State House, Boston
Michigan	June 21-27*† June 10-16*†	Ann Arbor	J. L. Champagne, 3714 W. McNichols Rd., Detroit 21
Minnesota			E. A. Nelson, 2236 Marshall Ave., St. Paul 4W
Mississippi			C. V. Pettey, Jr., Box 387, Magnolia
Missouri			R. R. Rhoades, Central Trust Bldg., Jefferson City
Montana			E. A. Cogley, Medical Arts Bldg., Great Falls
Nebraska			H. E. Weber, Stuart Bldg., Lincoln
Nevada	Dec. 11	Las Vegas	R. Whitehead, P.O. Box 1547, Reno
New Hampshire			L. U. Bergeron, 211 High St., Somersworth
New Jersey	Nov. 27, 28* Nov. 29* Nov. 28†	Philadelphia Trenton Philadelphia	C. J. Schweikhardt, 150 E. State St., Trenton 8
New Mexico			G. D. Hastain, Box 1007, Clovis
New York	Nov. 30, Dec. 1 Dec. 5-8	New York Buffalo New York Albany Syracuse Buffalo	D. F. Wallace, University of the State of New York, State Education Department, Division of Professional Education, Albany 1
North Carolina			J. H. Guion, Doctors Bldg., Charlotte 7
North Dakota	July 9-13	Fargo	R. L. Bork, Williston
Ohio			D. E. Bowers, 322 E. State St., Columbus 15
Oklahoma			W. H. Stephens, Plaza Court Bldg., Oklahoma City
Oregon	Dec. 18-20	Portland	C. Wheeler, Medical Arts Bldg., Portland
Pennsylvania	Dec. 6, 7* Dec. 6†	Philadelphia	P. Swanson, 8111 Jenkins Arcade, Pittsburgh
Puerto Rico			J. Mercado C., Comercio St., #452, San Juan
Rhode Island			A. D. Spicer, 7 Wells St., Westerly
South Carolina			W. J. Brockington, 2827 Millwood Ave., Columbia 1
South Dakota			W. P. Powell, Box 409, Vermillion
Tennessee	Dec. 13-16	Memphis	C. R. Aita, Bennie-Dillon Bldg., Nashville
Texas			R. T. Weber, Capital National Bank Bldg., Austin 16
Utah	June 25-29*†	Salt Lake City	J. O. Douglas, 2507 Madison Ave., Ogden
Vermont	June 25-27	Burlington	B. S. Pinney, 215 Pearl St., Burlington
Virginia	June 11-16* June 13, 14†	Richmond	J. M. Hughes, Medical Arts Bldg., Richmond
Washington	Jan. 15-18‡		G. J. Chatalas, Stimson Bldg., Seattle
West Virginia	June 18-20* June 19, 20†	Morgantown	A. B. Drake, 1355 Fourth Ave., Huntington
Wisconsin	Jan. 8-11‡ June 4-7‡		A. H. Clark, 794 N. Jefferson St., Milwaukee 2
Wyoming			W. J. Ryan, Boyd Bldg., Cheyenne

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NATIONAL EXAMINATIONS

Name	*Date*	*Place*	*Secretary and Address*
American Board of Dental Public Health			D. J. Galagan, Divn. of Dental Public Health, PHS, Dept. of Health, Education and Welfare, Washington, D.C.
American Board of Oral Pathology	Dec. 9, 10		W. G. Shafer, Indiana University, School of Dentistry, 1121 W. Michigan St., Indianapolis 2
American Board of Oral Surgery	Dec. 4 Mar. 24-27	Chicago	L. M. FitzGerald, Roshek Bldg., Dubuque, Iowa
American Board of Orthodontics	Apr. 23-28	Los Angeles	A. W. Moore, University of Washington, School of Dentistry, Seattle 5
American Board of Pedodontics			R. L. Ireland, College of Dentistry, University of Nebraska, Lincoln 8, Neb.
American Board of Periodontology			B. O. A. Thomas, 668 Homer Ave., Palo Alto, Calif.
American Board of Prosthodontics			C. H. Jamieson, David Whitney Bldg., Detroit 26
Council on Dental Education, Dental Aptitude Tests	Jan. 5, 6 Apr. 27, 28		B. F. Miller III, Acting Secretary, 222 E. Superior St., Chicago 11
National Board of Dental Examiners	Dec. 4, 5		Grace Parkin, 222 East Superior St., Chicago 11

MEETINGS OF OTHER ORGANIZATIONS

Name	*Date*	*Place*	*Secretary or Chairman and Address*
Academy of General Dentistry	Feb. 18-21	Chicago	A. L. Knab, 8500 Stony Island Ave., Chicago 17
Academy of Oral Dynamics	Dec. 3		J. T. McSweeney, 140 E. 80th St., New York 21
All India Dental Association (17th Annual Conference)	Jan. 4-6	Ahmedabad	P. V. Diwanji, India House 122, Cumballa Hill, Bombay 26
American Academy of Dental Medicine	Dec. 3	New York	G. F. Clarke, 554 Franklin St., Melrose 76, Mass.
American Academy of Restorative Dentistry	Feb. 17, 18	Chicago	W. Branstad, Lowry Medical Arts Bldg., St. Paul 2
American Association of Audio Analgesia	Nov. 30	New York	H. Feiner, 745 Fifth Ave., New York 22
American Association of Dental Schools	Mar. 18-21	St. Louis	R. Sullens, 840 N. Lake Shore Dr., Chicago 11
American Association of Endodontists	Feb. 11-14	Miami Beach, Fla.	R. A. Uchin, 1040 Bayview Dr., Ft. Lauderdale, Fla.
American Institute of Oral Biology	Nov. 6-10	Palm Springs, Calif.	M. L. Meyer, 2240 Channing Way, Berkeley 4, Calif.
American Psychosomatic Society	Mar. 30-Apr. 1	Rochester, N.Y.	S. Wolf, 265 Nassau Rd., Roosevelt, N.Y.
American Public Health Association, Dental Health Section	Nov. 13-17	Detroit	D. F. Striffler, New Mexico Dept. of Public Health, 408 Galisteo St., Santa Fe
Austrian Dental Society, Centennial Jubilee Congress	Nov. 14-18	Vienna	S. Loos, Weihburggasse 10-12, Vienna 1, Austria
Central America and Panama Dental Federation (Fifth Congress)	Jan. 21-26	Panama	A. H. Berguido, Apartado 4115, Panama, Republic of Panama
Chicago Dental Society	Feb. 18-21	Chicago	K. S. Richardson, 30 N. Michigan Ave., Chicago
Congrès de L'Entente Odontologique	Nov. 20-26	Paris, France	J. L. Dephilippe, 39 Blvd. Malesherbes, Paris 8e, France
Denver Dental Association Midwinter Meeting	Jan. 7-10	Denver	G. L. Ogle, Republic Bldg., Denver 2

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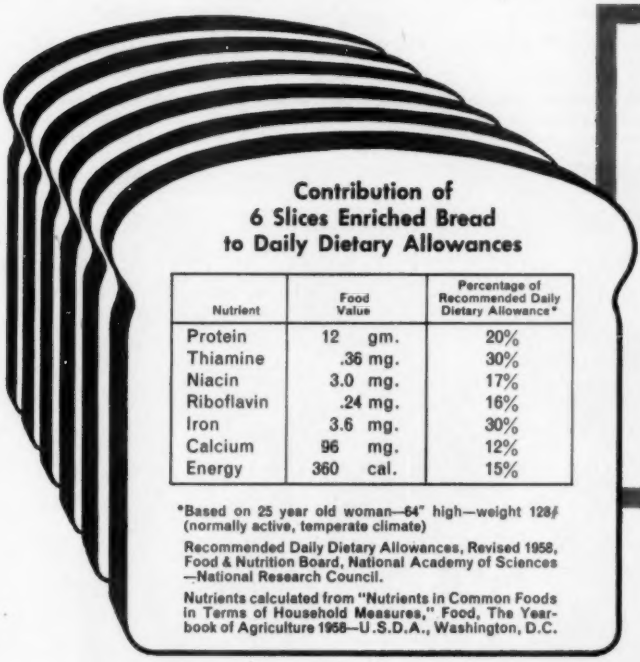

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Name	*Date*	*Place*	*Secretary or Chairman and Address*
Fédération Dentaire Internationale, (50th Annual Session)	July 7-14	Cologne, Germany	G. H. Leatherman, 35 Devonshire Pl., London W.1, England U.S.A. Section, O. H. Moen, 6 Main St., Watertown, Wis.
Greater New York Dental Meeting (Thirty-seventh)	Dec. 4-8	New York	Mrs. M. Purdy, 106-A Hotel Statler Hilton, New York 1
Greater Philadelphia (29th Annual Meeting)	Mar. 27-30	Philadelphia	M. Kohn, Sheraton Hotel, 17th St. & Pennsylvania Blvd., Philadelphia 3
International Academy of Orthodontics	Nov. 3	Los Angeles	M. Schleimer, 5828 N. Adenmoor Ave., Lakewood, Calif.
International Association for Dental Research	Mar. 15-18	St. Louis	J. C. Muhler, Indiana University Dental School, 1121 W. Michigan St., Indianapolis
International Dental Congress (Thirteenth)	July 7-14	Cologne, Germany	G. H. Leatherman, 35 Devonshire Pl., London W.1, England U.S.A. Section, O. H. Moen, 6 Main St., Watertown, Wis.
International Dental Congress of Uruguay-Argentina	Nov. 12-19	Montevideo, Uruguay	J. C. Turell, Av. Agraciada 1464 (P. 13), Montevideo, Uruguay
Italian Medical Dental Association, (35th Congress)	Dec. 8-12	Milan	P. Lalli, Via Bonifacio VIII, 22, Rome, Italy
Mexican Dental Association (Sixth biennial)	Nov. 19-23	Mexico City	C. J. Cornish, Sinaloa No. 9, Mexico 7, D.F.
Midwest Society of Periodontology	Feb. 18	Chicago	L. Howlett, Jr., Medical Arts Bldg., Springfield, Mo.
New England Dental Society	Nov. 1, 2	Boston	W. F. O'Meara, 904 Main St., Hartford, Conn.
New Orleans Dental Conference	Nov. 4-6	New Orleans	J. R. Bond, Maison Blanche Bldg., New Orleans
Northeastern Society of Periodontists	Nov. 3	New York	I. W. Scopp, V.A. Hospital, First Ave. at E. 24th St., New York 10
Peru National Dental Congress (Fifth) and First International Congress of Stomatology	Nov. 5-11	Lima	G. Roose C., Av. Pershing 155, San Isidro, Lima, Peru
Southern Academy of Oral Surgery	Mar. 25, 26	Atlanta, Ga.	T. E. Braly, Jr., Volunteer Bldg., Chattanooga, Tenn.
Southwestern Society of Periodontists	Apr. 28	Dallas	Secretary, Southwestern Society of Periodontists, Medical Arts Bldg., Tulsa, Okla.
Thomas P. Hinman Dental Meeting, (Semi-centennial celebration)	Mar. 25-28	Atlanta, Ga.	N. Blass, 727 W. Peachtree St., N.E., Atlanta 8, Ga.

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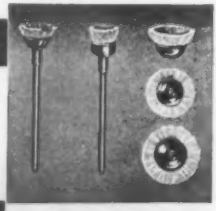

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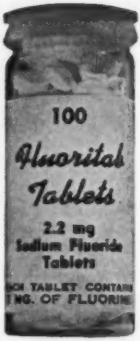

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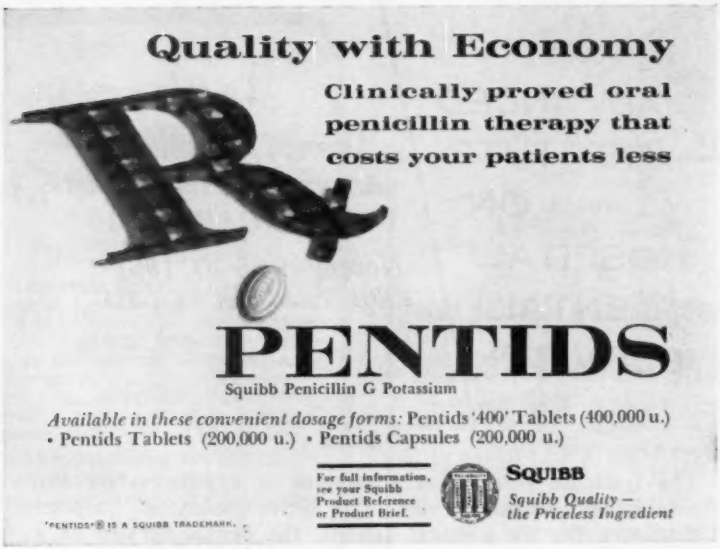
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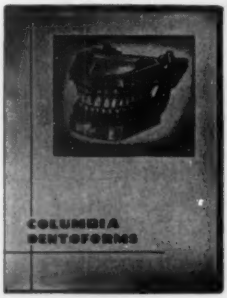

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Figure 1: Periapical radiograph of follicular cyst in third molar region. Note typical cyst outline and form. Note, also, absence of third molar.

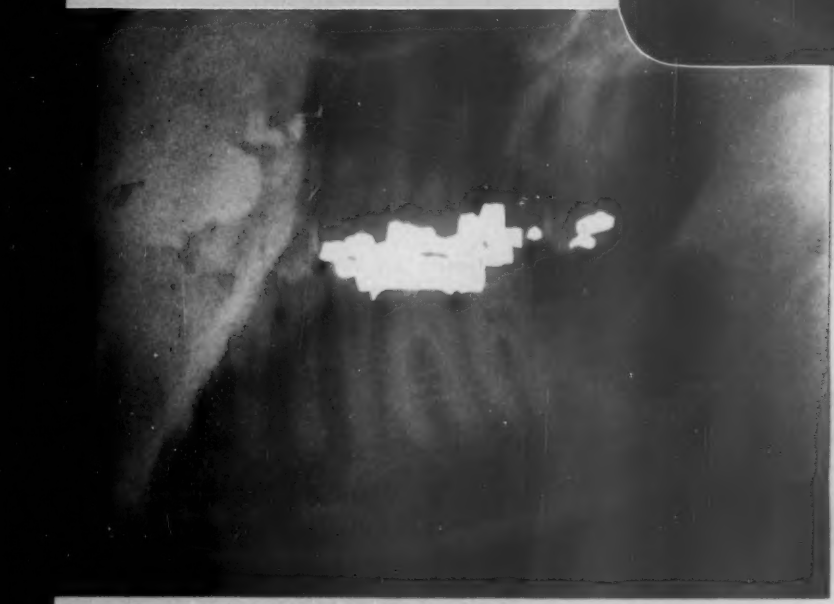

Figure 2: Extraoral view of another typical follicular cyst of the mandible.

Dentigerous Cyst: (See Figures 3, 4 and 5, facing page) Although similar in many respects to the follicular, the dentigerous cyst is easily differentiated by its distinctive feature of containing at least the crown of a tooth within its cyst cavity.

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Figure 3: An extraoral film of a "classical" dentigerous cyst.

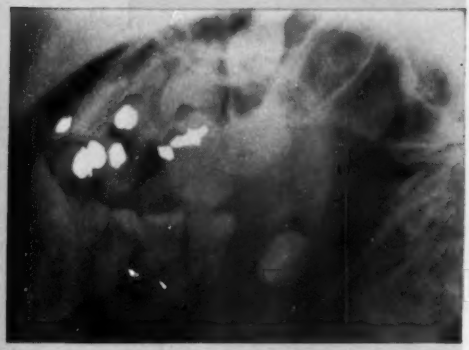

Figure 4: A dentigerous cyst whose involved third molar component has been severely displaced in the ramus by cystic pressure.

Figure 5: An unusual dentigerous cyst which appears to contain the entire body of the associated tooth.

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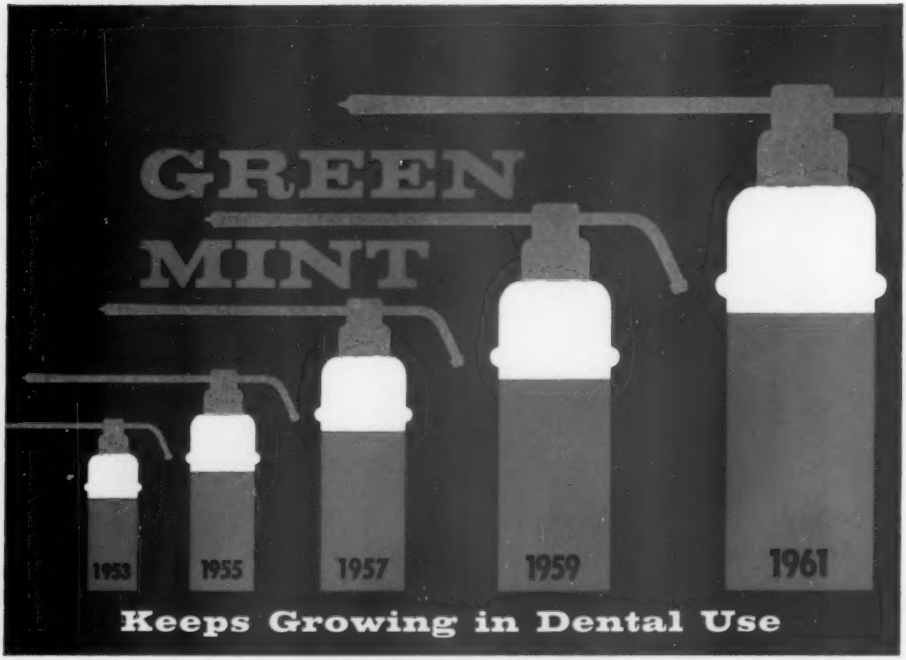

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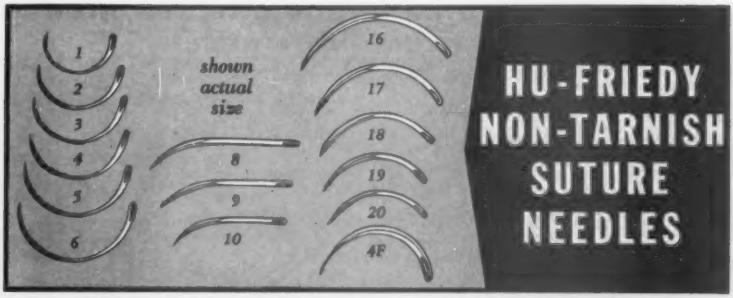

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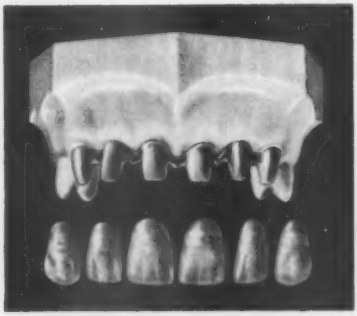
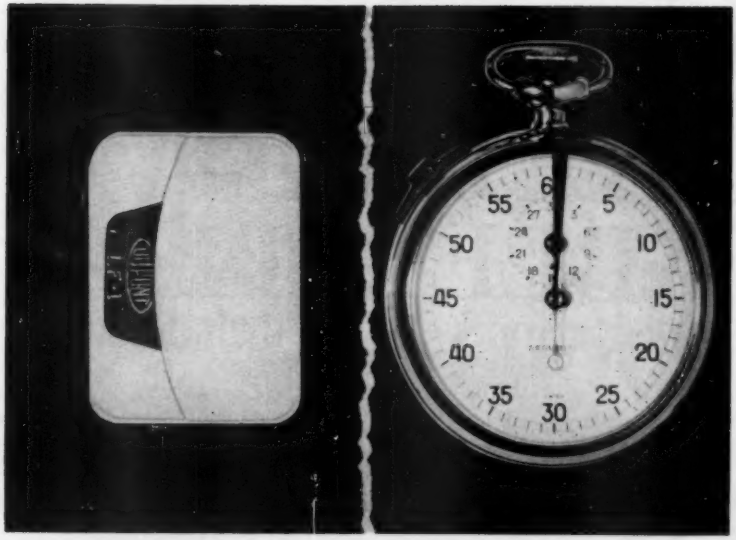
☐ Literature and price list on your services.
☐ Your mailing boxes and prescription pads.
☐ Your prepaid postage labels.

Dr.....D.D.S.
Address.....
City.....Zone....State.....



● *Above is a typical Kida Coping Bridge Restoration showing the most recent improvement in our construction permitting maximum durability and esthetics.*

Visit Booth No. 177
Greater New York Meeting, Dec. 4-8, 1961,
Statler Hilton Hotel, New York



LIGHTNING FAST... for speed, safety, savings

Just a second—that's the longest exposure you'll have to make with Du Pont's "LF" Dental X-Ray Film. The five-fold speed increase means less radiation for the operator and patient, sharper pictures, far less effect from patient motion. You'll be able to use low-distortion long-cone technique with normal exposure times, too.

There's a complete line of Du Pont Dental X-Ray Films to help you get every diagnostic value from your equipment and skill. And to help you get the most from these films, we've prepared a simple, easily read technique chart. We'd be happy to send you one—or any other technical information you'd like—for a postcard to: E. I. du Pont de Nemours & Co. (Inc.), Photo Products Dept., Wilmington 98, Delaware.

DU PONT

BETTER THINGS FOR BETTER LIVING ... *THROUGH CHEMISTRY*

BUT DOCTOR, AREN'T CALCIUM TABLETS AS GOOD AS MILK?

NO . . . calcium tablets are *not* as good as milk . . . because in providing the body with essential nutrients milk is really calcium-*plus*. Milk and other dairy foods supply most of the calcium in the diet, and contribute protein, riboflavin and many other nutrients that are needed daily by the healthy adult, the older citizen, the overweight and the patient with a disturbance of calcium metabolism. All need the liberal amounts of these ingredients . . . as well as calcium . . . with which milk is uniquely endowed. And for those on a restricted diet, inclusion of dairy and other foods which are rich in the nutrients that are sometimes marginal in our diet . . . is especially important.

When consumed in suggested amounts . . . two glasses daily for adults . . . milk or its equivalent in milk products provides two-thirds of the 0.8 gram of calcium recommended for maintenance, plus two-fifths of the riboflavin, one-fourth of the protein and important amounts of vitamin A, thiamine and other nutrients. If credited with the value of the other nutrients it contains, milk is by far the most economical source of calcium available.

During the middle and later years of life, changes take place in the body which may have an adverse effect on calcium metabolism. The formation of stones containing calcium and other salts which may block the urinary tract is affected by several known factors including sex, race, and geography. The consumption of recommended amounts of *dietary calcium* has not been found to be associated with the development of *urinary calculi*. In some cases of osteoporosis . . . the most common bone disease in women of middle age . . . a liberal calcium allowance may be a valuable adjunct to hormonal therapy in stimulating recalcification of demineralized bone!

Milk and other dairy foods stand alone in their ability to provide calcium needed by adults of all ages in a form that is highly palatable, easily digested, and readily absorbed . . . and they also provide other nutrients which contribute to a balanced dietary and buoyant health.

The nutritional statements made in this advertisement have been reviewed by the Council on Foods and Nutrition of the American Medical Association and found consistent with current authoritative medical opinion.

AVAILABLE ON REQUEST:
Reprints of this series of messages on Calcium
NEW CALORIE-RESTRICTED DIET SHEETS

A non-profit organization

Since 1915 promoting better health through nutrition research and education

NATIONAL DAIRY COUNCIL
111 NORTH CANAL STREET • CHICAGO 6, ILLINOIS

just 4 drops (concentrated)

add your own water (economical) for one-fourth glass of mouth wash

refreshing flavor—deodorizing —cleansing—mildly astringent

Astring-O-Sol® Mouth Wash

American Ferment Division, Breon Laboratories Inc., N. Y. 18, N. Y.

Rx *Prescription for efficiently handling appointments:*

1962 ADA APPOINTMENT BOOK

All dental care begins with an appointment. And you, if your practice is near the national average, will be keeping more than 3,000 dental appointments with your patients next year. How you schedule them, and the appointment book you use, can be extremely important in the maintenance of an efficient practice.

May we suggest a 1962 ADA Appointment Book to keep you on schedule next year. Designed by the Association for its members, the ADA Appointment Book contains special features for the busy practice. For example:

- **— 8 a.m. to 9 p.m. scheduling with spaces indicated for quarter, half and one hour appointments.**
- **— Week-at-a-time page layout lets you see your entire week's schedule at a glance.**
- **— Important, practice-building Patient Recall system in back of book.**

Order your 1962 ADA Appointment Book today by using the coupon below. Priced at a low $3.00.

Order Department 728
American Dental Association
222 East Superior Street
Chicago 11, Illinois

Please send me _____ copies of the 1962 ADA Appointment Book at $3.00 per copy. My remittance is enclosed.

Name _____

Address _____

City _____ **Zone** ____ **State** _____

Illinois purchasers add 4% use tax.

Recommend the IDEAL PAIR for Good Denture Care

WERNET'S IMPROVED FORMULA DENTU-CREME and DENTURE BRUSH

Here is Wernet's "Home-Care Pair" for denture patients, better than ever—

Improved formula DENTU-CREME with new, long-refreshing taste, deeper foaming, easier rinsing. Careful research made it possible to add these "patient appeal" benefits while retaining Dentu-Creme's safe, superior cleaning action.

Consumer panel tests show denture patients overwhelmingly prefer Wernet's *improved formula* Dentu-Creme. Typical comments: "It foams so well and rinses so easily . . . cleaning seems faster now." "My dentures haven't sparkled so since they were new." "Gives me less worry about denture breath."

WERNET'S DENTURE BRUSH, with large, easy-grip handle and two functionally designed bristle heads, cleans the *entire* denture without harm to precision contours or delicate characterization.

Let Wernet's *improved formula* Dentu-Creme—teamed up with the double-header *practical* Brush—help YOUR patients follow recommendations to "Keep up the good-home-care habit."

BLOCK DRUG COMPANY, INC.
105 Academy Street, Jersey City 2, N.J.
"Quality Products for Dental Health"

PBP **PROFESSIONAL BUDGET PLAN**
303 E. Wilson St., Madison 3, Wis.
management consultants to the professions

Good to the last squeeze

Why was this not done long ago? you'll think, after your first mix. Liquid in tubes is so convenient—no bottles to tip—no pipettes. Because liquid is fully protected from loss or absorption of moisture it will not deteriorate—you can use it to the last squeeze.

No change in the product — you are still getting your preferred filling material.

At a sensible price

Powder (18 gms.) $3.60 per bottle
Liquid (15cc) 1.20 per tube
(Or slightly less in quantity purchases)

DIAFIL

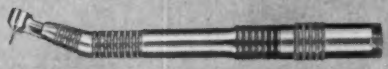
For anterior and posterior fillings
In its new, modern packaging

Write for free sample
(Sample liquid in bottle only)

PFINGST & COMPANY, INC.
62 COOPER SQUARE • NEW YORK 3, N.Y.

DUAL

PURPOSE SELECTOR VALVE



MINIATURE AIR DRIVE

STANDARD AIR DRIVE

New "In-Out" button controls air flow to Standard or Miniature Contra Angle. When the selector button is "In", Standard Air-Drive is ready for operation. When the Miniature contra angle is required, simply "hang-up" the Standard angle and pull out the selector button . . . the Miniature is then ready for use. Both Contra Angles operate from the same foot control. Saves time, eliminates wasted motion! Control box must be equipped with the Swivel Support Arm if the Dual Purpose Selector Valve is to be used!

May be factory installed on new Air Drive "400" or available as an accessory on all existing Air Drive "400" units.

An *Engineered* product of:

Provides fingertip selection of Standard or Miniature Head Air-Drive contra angles . . . Convenient and efficient!

MD

MIDWEST DENTAL MANUFACTURING CO.
1980 N. HAWTHORNE • MELROSE PARK, ILLINOIS

SATISFY ALL YOUR SPECIFIC NEEDS WITH THESE DIFFERENT AND UNIQUE WAXES FROM SURGIDENT

PERIPHERY WAX

(ILLUSTRATION AT TOP)

Especially formulated for making stops, post-damming and lining the periphery of the tray. Extra soft for minimum tissue displacement. Tacky for quick adherence to the tray. Easily conformable at room temperatures yet may be tempered safely in hydrocolloid techniques.

COPRWAX SINGLE SHEETS

Coprwax in single sheet form which may be cut or folded to fit whatever bite requirements are necessary. The copper content increases the thermal conductivity of the wax. Easier to temper. Easier to chill.

COPRWAX BITE WAFERS

(ILLUSTRATION ABOVE)

Special wax contains copper particles to insure fast, uniform heat transmission during warming and cooling processes. Thin sheet of soft aluminum through center prevents "bite through". Readily comforms to outline of occluding teeth and assures proper relation between upper and lower models on articulator. Available in both wafers and laminated sheets.

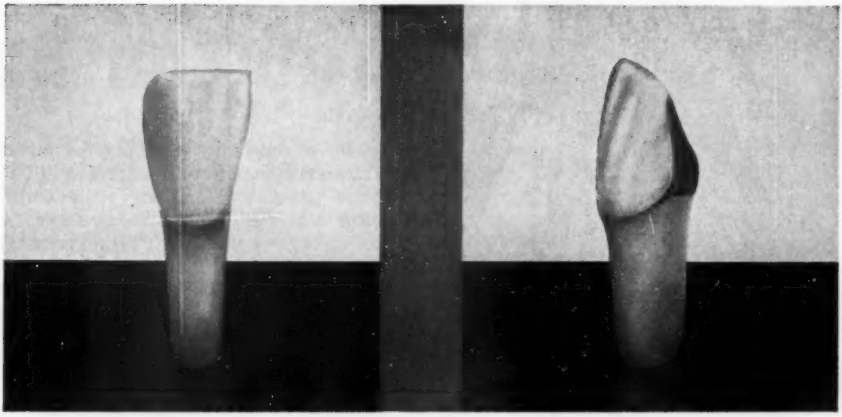
Have you bought your Surgident Splash Pan yet? Sturdy polythylene—unbreakable, easy to clean. Cushions fall if appliance is torn from operator's hands. Choice of 8 colors.

Have you tried the impression material that makes both mucostatic and pressure impressions for full dentures? MULTI-FORM is never sticky, rubs right off, is easy to mix and is accurate and economical. Setting time is consistent—not affected by heat or cold.

See your dental dealer

Surgident LTD.

3871 Grand View Ave., Los Angeles 66, Calif.

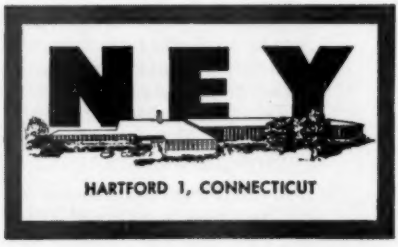


NEY-ORO P-16 CASTING GOLD FOR PORCELAIN TO GOLD RESTORATIONS

NEY-ORO P-16 is a hard, gold color crown and bridge alloy designed especially for use in porcelain fused to gold technics. The porcelain employed in combination with it should mature at a temperature of about 1800°F and should also be one especially formulated for gold-porcelain restorations.

The composition of NEY-ORO P-16 has been delicately balanced to provide the maximum bond between porcelain and gold with no discoloration of the porcelain. Repeated laboratory tests have shown that the bond is actually stronger than the porcelain so that when a composite structure is tested to destruction the break always occurs through the porcelain rather than at the interface between the metal and the porcelain. The strength of the gold is ample, even for long span bridges and is not reduced by repeated firings of the porcelain. In fact, repeated firing makes NEY-ORO P-16 stronger than in the "as cast" condition. Laboratory tests also prove that NEY-ORO P-16 has as high, or higher, resistance to corrosion in the mouth than the usual casting golds. To accompany NEY-ORO P-16, Ney has developed NEY-ORO P-16 Solder which flows at 1925°F, low enough to permit its being flowed over NEY-ORO P-16 Casting Gold (melting range 2020°F-2170°F); and high enough to withstand the firing of the porcelains whose firing temperatures are about 1800°F.

For those interested in the increasingly popular porcelain fused to gold type of bridge, Ney offers this thoroughly researched, thoroughly tested dependable team of NEY-ORO P-16 Casting Gold and its companion solder. ***The J. M. Ney Company, Hartford 1, Conn.***



You can help

The image of dentistry reaching the public mind and attracting youth to the profession is based upon the practicing dentist. It sees him as a respected member of the community, in comfortable circumstances, with professional prestige among his colleagues, with a strong sense of civic responsibility and with an honest dedication to the service of others. As long as this image is good, dental schools will continue to obtain qualified and able students.

If you are concerned about today's youth, you

Dental Aptitude Testing Program

Tests to be given at following times

January 5-6, 1962
April 27-28, 1962

Applicants for 1962 Freshman Classes

PROCEDURE TO BE FOLLOWED:

1. Obtain directly from the school or schools in which you are interested their admissions application. Completed admissions applications are to be returned to the schools.
2. Obtain the special application form and brochure for the aptitude tests from the school or from the Division of Educational Measurements. This completed application is to be returned to the Division of Educational Measurements, Council on Dental Education, American Dental Association, 222 East Superior Street, Chicago 11, Illinois.
3. The completed application form and $15.00 testing fee must be received in Chicago by December 15, 1961 for the January testing dates; and by April 13, 1962 for the April testing dates.

DENTAL SCHOOLS

ALABAMA
School of Dentistry
University of Alabama
Birmingham 3, Alabama

CALIFORNIA
A School of Dentistry
College of Physicians and Surgeons
San Francisco 3, California

School of Dentistry
University of California
San Francisco 22, California

School of Dentistry
University of Southern California
Los Angeles 7, California

School of Dentistry
College of Medical Evangelists
Loma Linda, California

DISTRICT OF COLUMBIA
School of Dentistry
Georgetown University
Washington 7, D. C

College of Dentistry
Howard University
Washington 1, D. C.

GEORGIA
The School of Dentistry
Emory University
Atlanta 3, Georgia

ILLINOIS
Chicago College of Dental Surgery
Loyola University
Chicago 12, Illinois

The Dental School
Northwestern University
Chicago 11, Illinois

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recruit dental students

can promote an interest in dentistry as a career among your patients, in your schools and your community. As a dentist in your community, you are a valuable aid in recruiting future members of the profession. The American Dental Association provides publications—you provide the contact.

Write to the Council on Dental Education, American Dental Association, 222 East Superior St., Chicago 11, Ill., for: *Dental Aptitude Testing Program, Careers in Dentistry*, and *Dental Students' Register*. Single copies free.

College of Dentistry
University of Illinois
Chicago 12, Illinois

INDIANA

School of Dentistry
Indiana University
Indianapolis 2, Indiana

IOWA

College of Dentistry
State University of Iowa
Iowa City, Iowa

KENTUCKY

School of Dentistry*
University of Kentucky
Lexington, Kentucky

School of Dentistry
University of Louisville
Louisville 2, Kentucky

LOUISIANA

School of Dentistry
Loyola University
New Orleans 18, Louisiana

MARYLAND

Baltimore College of Dental Surgery
University of Maryland
Baltimore 1, Maryland

MASSACHUSETTS

Harvard School of Dental Medicine
Boston, Massachusetts

Tufts University School of Dental Medicine
Boston 11, Massachusetts

MICHIGAN

School of Dentistry
University of Detroit
Detroit 26, Michigan

School of Dentistry
University of Michigan
Ann Arbor, Michigan

MINNESOTA

School of Dentistry
University of Minnesota
Minneapolis 14, Minnesota

MISSOURI

School of Dentistry
The University of Kansas City
Kansas City 6, Missouri

School of Dentistry
St. Louis University
St. Louis 4, Missouri

School of Dentistry
Washington University
St. Louis 10, Missouri

NEBRASKA

School of Dentistry
The Creighton University
Omaha 2, Nebraska

College of Dentistry
University of Nebraska
Lincoln 8, Nebraska

NEW JERSEY

School of Dentistry
Fairleigh Dickinson University
Teaneck, New Jersey

College of Dentistry
Seton Hall University
Jersey City, New Jersey

NEW YORK

School of Dental and Oral Surgery
Columbia University
New York 32, New York

College of Dentistry
New York University
New York 10, New York

School of Dentistry
University of Buffalo
Buffalo 14, New York

NORTH CAROLINA

The School of Dentistry
The University of North Carolina
Chapel Hill, North Carolina

OHIO

College of Dentistry
The Ohio State University
Columbus 10, Ohio

School of Dentistry
Western Reserve University
Cleveland 6, Ohio

OREGON

Dental School
University of Oregon
Portland, Oregon

PENNSYLVANIA

School of Dentistry
Temple University
Philadelphia 40, Pennsylvania

School of Dentistry
University of Pennsylvania
Philadelphia 4, Pennsylvania

School of Dentistry
University of Pittsburgh
Pittsburgh 13, Pennsylvania

TENNESSEE

School of Dentistry
Meharry Medical College
Nashville 8, Tennessee

College of Dentistry
University of Tennessee
Memphis 3, Tennessee

TEXAS

College of Dentistry
Baylor University
Dallas 10, Texas

University of Texas Dental Branch
Houston 25, Texas

VIRGINIA

School of Dentistry
Medical College of Virginia
Richmond 19, Virginia

WASHINGTON

School of Dentistry
University of Washington
Seattle 5, Washington

WEST VIRGINIA

School of Dentistry
West Virginia University
Morgantown, West Virginia

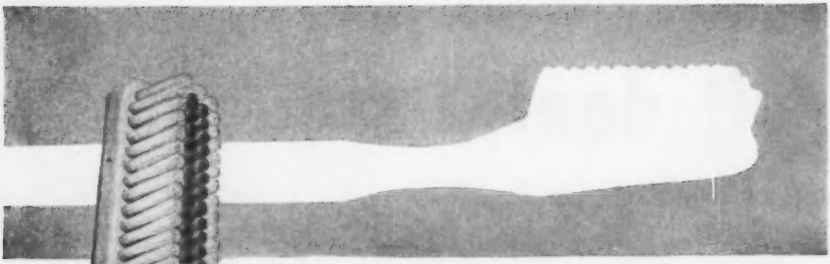
WISCONSIN

School of Dentistry
Marquette University
Milwaukee 3, Wisconsin

PUERTO RICO

School of Dentistry
University of Puerto Rico
San Juan, Puerto Rico

*FIRST CLASS ACCEPTED FOR SEPTEMBER, 1962



THE SCIENCE-CONCEIVED

PRO DOUBLE DUTY

PERFECTED WITH INDEPENDENT TECHNICAL AND CHAIR-SIDE RESEARCH

Out of laboratory and clinical research has come a totally new type of toothbrush—the Pro Double Duty. The Double Duty "brings to life" what was previously only an objective in toothbrush design. It offers

1. Thorough cleansing of *all* tooth surfaces.
2. Completely safe and effective gingival brushing.

The Pro Double Duty Toothbrush is unique in combining both firm and gentle bristles in a scientifically established pattern in the same brush head. Two rows of firm center bristles scrub and sweep both occlusal and vertical tooth surfaces, while an outside row of gentle bristles brushes gingivae safely, efficiently. Soft outside bristles form a safety shield for the harder inside rows. Four variations available in stores: (1) All-nylon adult, in regular or medium length head. (2) Nylon-natural combination. (3) All-nylon Child's Brush. (4) Tote Double Duty (folding) with travel cover.

FOR OFFICE DEMONSTRATION!

12″ Giant Size Double Duty Toothbrush to demonstrate proper brushing.

Pro-phy-lac-tic Brush Company, Dept. C, Florence, Mass.

Please send me a 12″ Double Duty Toothbrush. I enclose_____check, _____money order, for $1.98.

NAME_____

ADDRESS_____

CITY_____ STATE_____

Modern As Tomorrow

RINN NARROW FILM—Here is perfect shape and form with a revolutionary, new "narrow technique". Twisting or bending develops optical distortion. For example, view these two buildings from an equal distance. One employs the flat and "narrow technique"; the other, curved. Which has greater clarity . . . definition . . . visability? Which doubles its power and vitality to the naked eye? Rinn Narrow X-Ray film serves in the same way. It inspires the "narrow technique" through more accurate film placement. Thus, the absence of bending minimizes distortion and provides greater patient comfort for anterior Roentgenography. It's ideal for all interproximals—particularly suitable for teenage periapicals. Obtainable in all speeds . . . matte finish? . . . of course! For further information see your dealer or write Rinn Corporation, 2929 North Crawford Ave., Chicago 41, Ill. Catalog of the complete Rinn line is available upon request.

Rinn

LEADERS IN THE DEVELOPMENT OF DENTAL X-RAY TECHNIQUES AND PRODUCTS

Now Novol introduces

a **PRE-STERILIZED** *Disposable Needle*

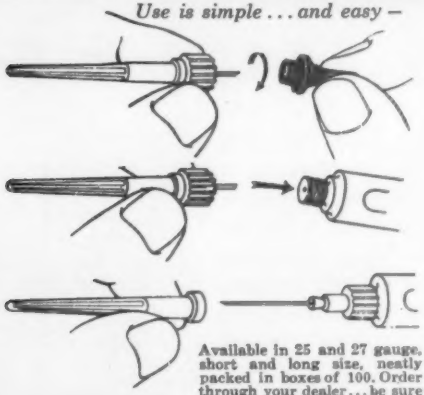
- *Fits like a regular needle!*
- *Fits ANY Syringe!*
- *Simple and easy to use!*

If you have ever used disposable needles, you will be amazed at the simplicity and ease with which the new NOVOL Disposable Needle may be used.

It fits *any* type of cartridge syringe, just like an ordinary needle and chuck . . . *specially threaded chuck insures perfect fit* . . . needle *shafts can't slip . . . it can't be damaged in handling . . . and the guard can't pop off!*

If you have not used disposable needles, you will find them wonderful time savers . . . sterility is always certain . . . needles are always sharp and perfect . . . and patients appreciate the extra consideration for their comfort and safety!

Use is simple . . . and easy —



Available in 25 and 27 gauge, short and long size, neatly packed in boxes of 100. Order through your dealer . . . be sure to specify *Novol* disposable needles!

1. **Remove threaded colored rubber guard, exposing end of needle which punctures cartridge.**
2. **Place exposed end through hole in the end of *ANY* type cartridge syringe. Screw down just as you would a metal chuck.**
3. **Pull off plastic sheath covering injecting end of needle . . . you're ready to inject with a sterile, sharp, disposable needle.**

Novocol CHEMICAL MFG. CO., INC.
BROOKLYN 7, NEW YORK
TORONTO 18, CANADA

LEADING PERIODONTISTS AGREE

that local irritation caused by food residues in areas not ordinarily reached by the toothbrush are an important contributing factor in periodontal disease . . . Literally thousands of dentists have written us attesting the merits and effectiveness of STIM-U-DENTS in the treatment of these diseases. STIM-U-DENTS are also helpful in the maintenance of optimum gingival health, and are so convenient to use after eating . . .

Send for Samples Today

STIM-U-DENTS

FINISH WHAT THE TOOTHBRUSH LEAVES UNDONE

STIM-U-DENTS, INC., 14035 Woodrow Wilson, Detroit 38, Mich.

☐ **Send FREE SAMPLES for patient distribution.** J.A.D.A. 11-61

Dr._____

Please enclose your Professional Card or Letterhead

Address_____

City_____ **Zone**_____ **State**_____

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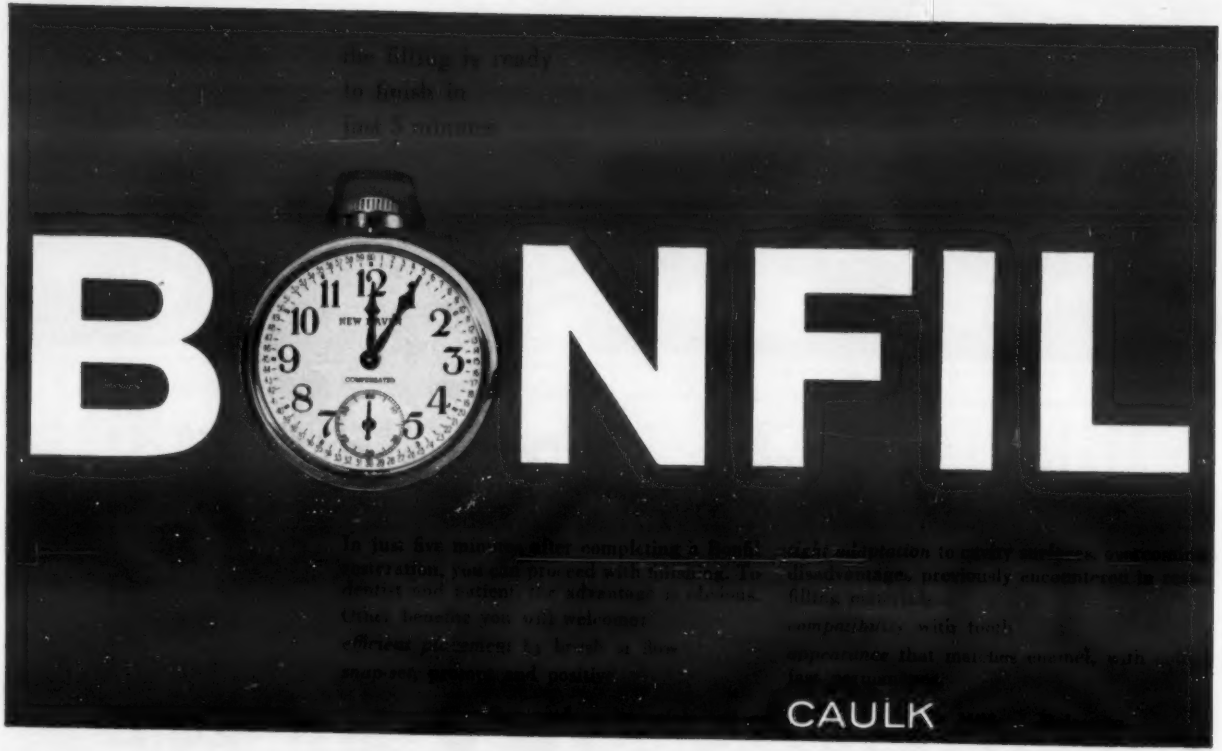
'AUTOMATIC AMALGAMATION'

With pellets of MICRO ALLOY (or Micro Non-Zinc Alloy) dispensing becomes simpler, speedier. Measurement is accurate without waste. Other Micro advantages: preloaded capsules to save chair time . . . smooth manipulation . . . plump, fat amalgam . . . dense structure . . . rapid development of strength for instant carving.

For modern materials call on CAULK Milford, Delaware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STATE _____

from the Aleutians
to Zorritos
HISTACOUNT®
PRODUCTS
Rx and Assorted Useful Pads, for instance. The Rx and Assorted Useful Pads we printed last year, placed end to end, would reach from the Aleutians to Zorritos, Peru.*
This fact is important because it reflects your faith in us . . . your satisfaction in our fine Histacount products.
If, perhaps, you haven't yet tried Histacount products, you should. You will be pleased with the fine quality, low prices, courteous service and unconditional guarantee.
PROFESSIONAL printing company, inc.
HISTACOUNT BUILDING
NEW HYDE PARK, N. Y.
America's Largest Printers to the Professions

If your community does not have fluoridated drinking water...

make their teeth more resistant to future tooth decay

℞ **Luride® Lozi-Tabs®**

STANDARDIZED SODIUM FLUORIDE IN PLEASANT-TASTING LOZENGE-TYPE TABLETS

Consistent and continuous sodium fluoride supplementation is highly effective and safe in the prevention of dental caries.(1)

One LURIDE LOZI-TAB daily... during the formative calcification of teeth... will make teeth more resistant to future caries and insure better dental health.

Compatible with office applications of stannous fluoride and/or daily brushings with toothpaste containing fluoride. The effects of dietary fluoride and topically applied stannous fluoride appear to be additive.[2]

DOSAGE: One LURIDE LOZI-TAB daily partially dissolved in mouth before swallowing.

COMPOSITION: Each LURIDE LOZI-TAB contains 1.0 mg. fluorine (from 2.2 mg. sodium fluoride). One tablet provides an amount of fluoride ion which is approximately equivalent to that contained in drinking water with 1.0 ppm fluorine.

AVAILABLE ON YOUR PRESCRIPTION in bottles of 100.
Contraindicated in communities with drinking water containing fluoride in excess of 0.3 ppm.

1.) Arnold, F. A. Jr., McClure, F. J. and White, C. L.: Dental Progress 1:3-12 (October) 1960.
2.) Muhler, J. C.: J.A.D.A. 61:431 (October) 1960.

HOYT *SAMPLES AND LITERATURE – Write Medical Department*
HOYT PHARMACEUTICAL CORP., NEWTON 58, MASS.

Ha! Ha! He says there's something new in impression trays!
WHAT?!? What could possibly be new in impression trays?
Why, a pure paper DISPOSABLE tray for each patient! Use it once and throw it away!

Yes, it's here . . . the most needed, most wanted tray in Dentistry . . . THE **Marché** TRAY

As personal as a toothbrush!

- Completely aseptic. . .the ultimate in patient appeal.
- Kind to tissue, avoids cold metallic shock.
- Eliminates clean-up time.
- Non-perforated for greater accuracy—ideal for any alginate impression material.
- Easily trimmed and individualized—adaptable for partials.

Auxiliary attachable handle available for withdrawing over severe undercuts. Order through your dealer.

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531 South Plymouth Court

Chicago 5, Illinois

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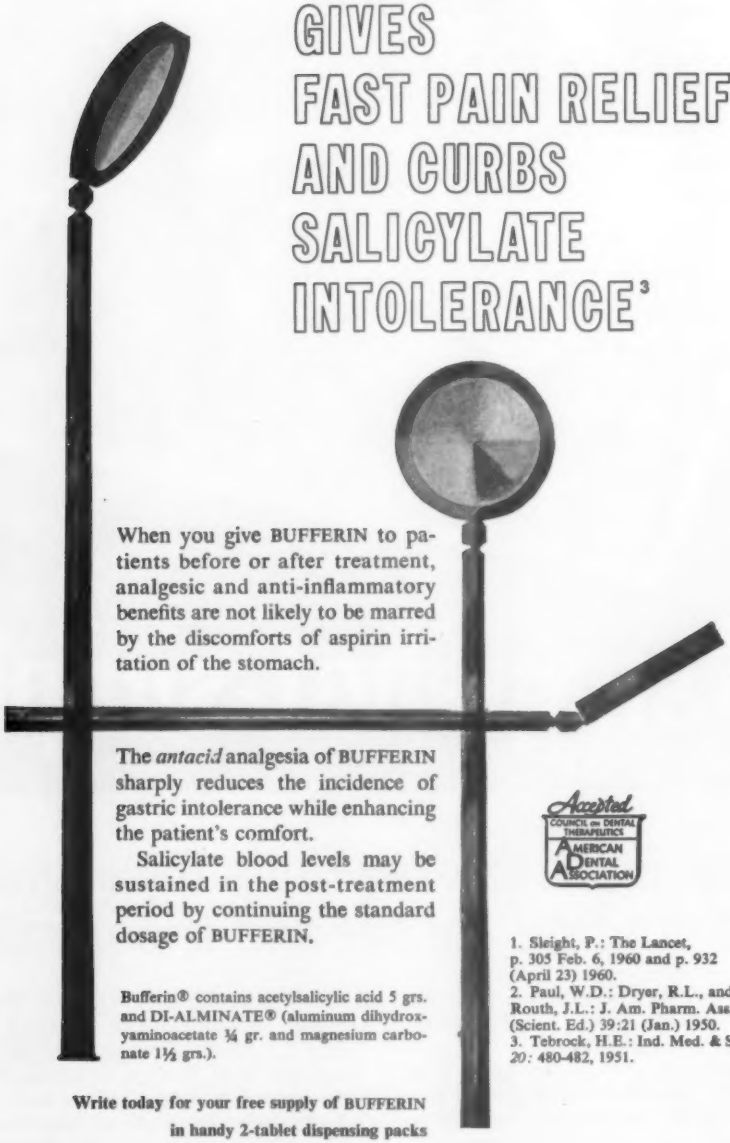

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1. Sleight, P.: The Lancet, p. 305 Feb. 6, 1960 and p. 932 (April 23) 1960.
2. Paul, W.D.: Dryer, R.L., and Routh, J.L.: J. Am. Pharm. Assn. (Scient. Ed.) 39:21 (Jan.) 1950.
3. Tebrock, H.E.: Ind. Med. & Surg. *20:* 480-482, 1951.

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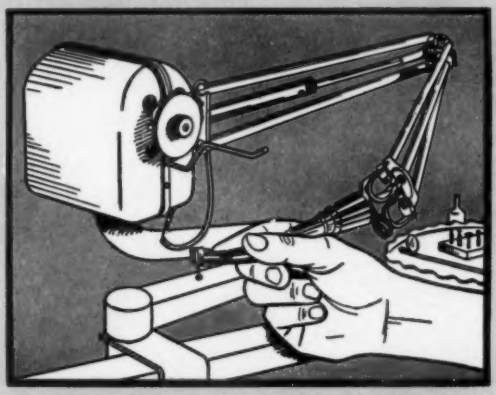

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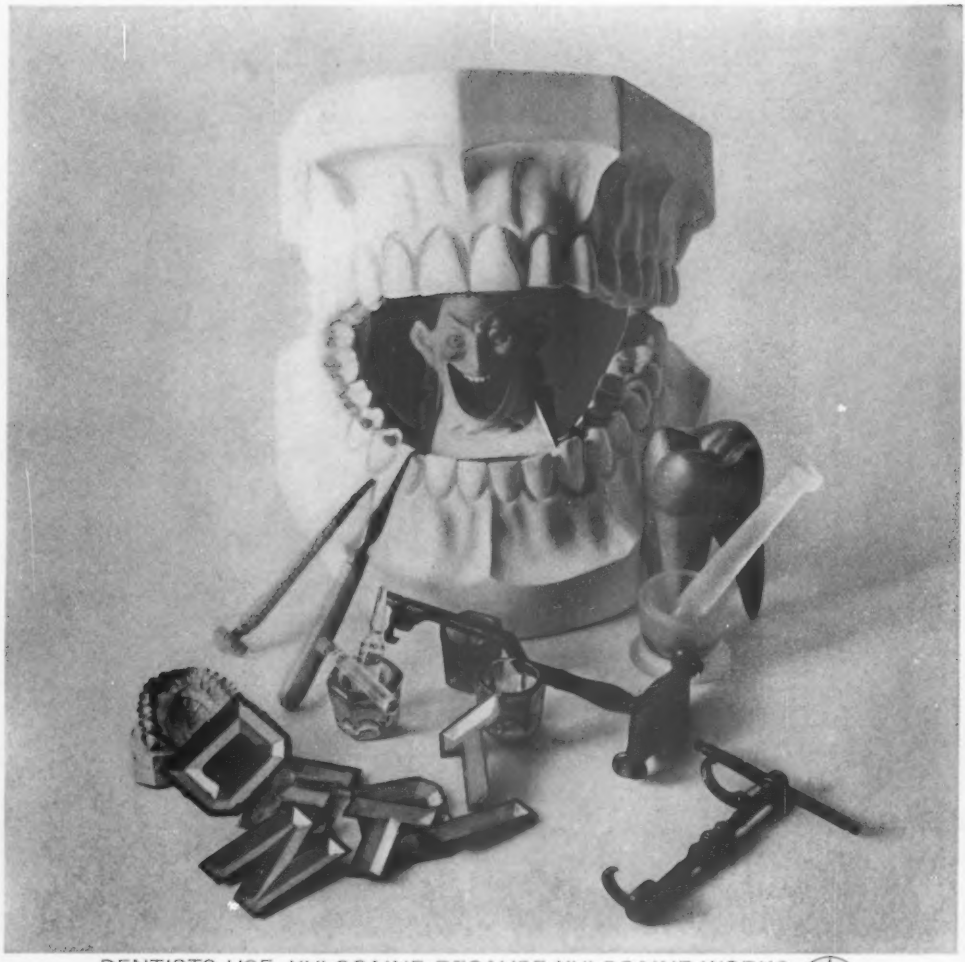

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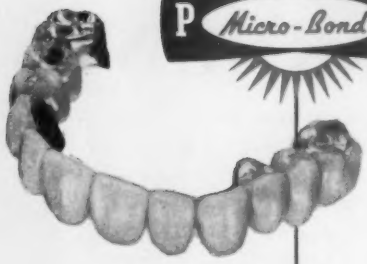

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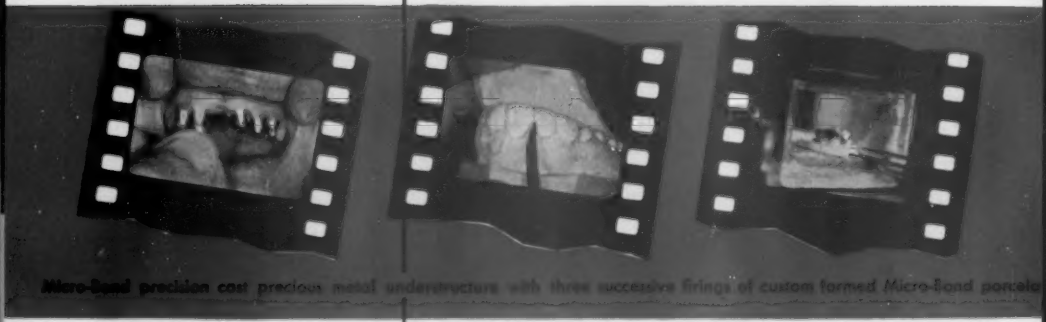

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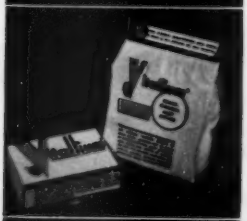

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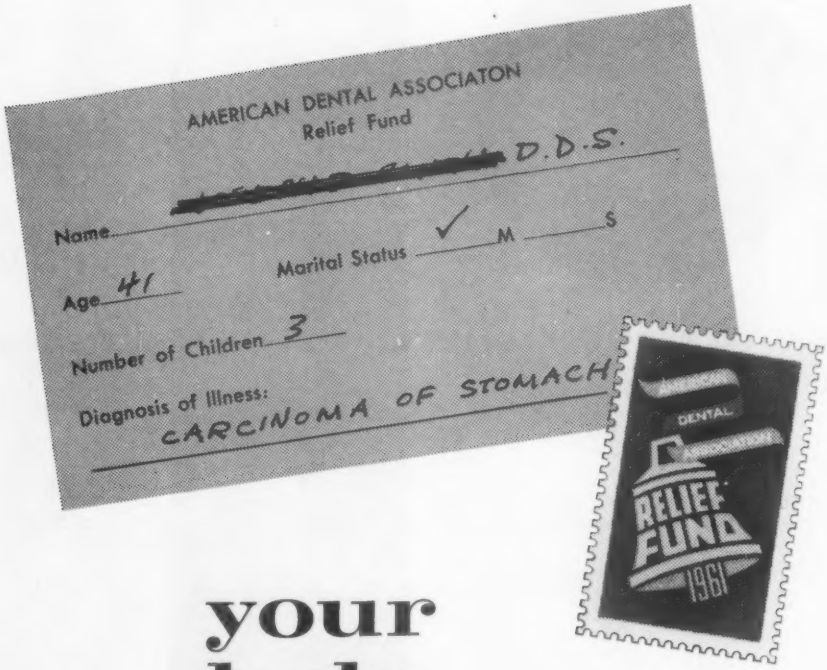

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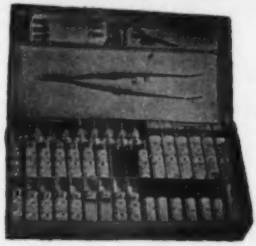

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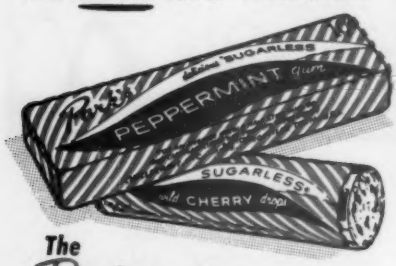

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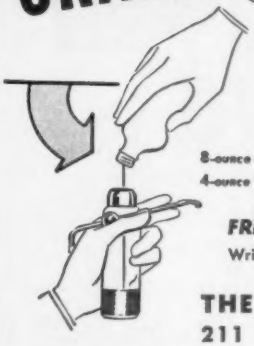

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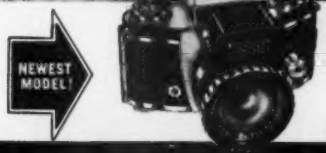

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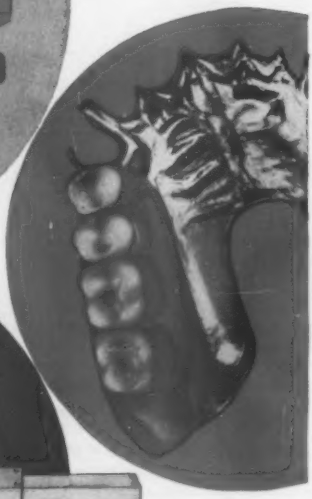

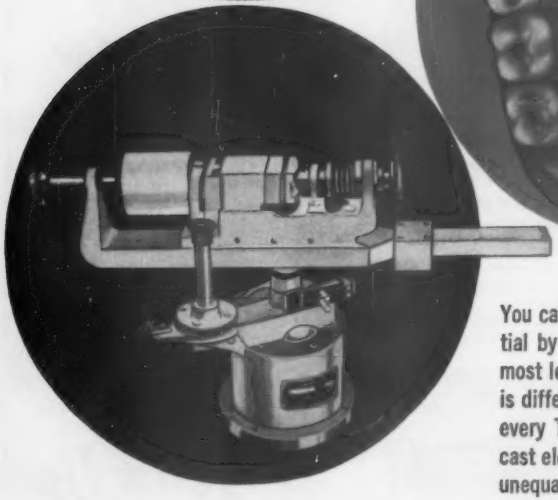

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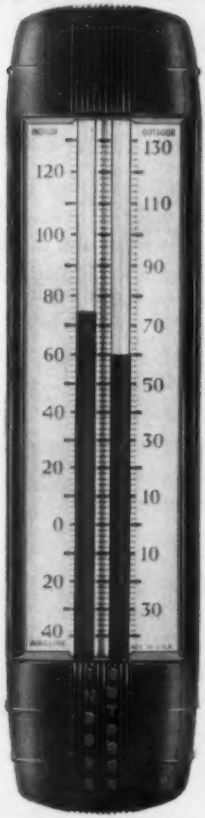

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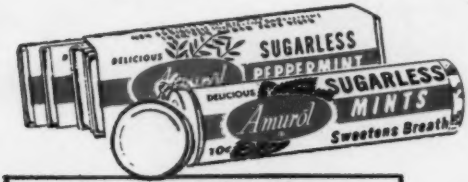

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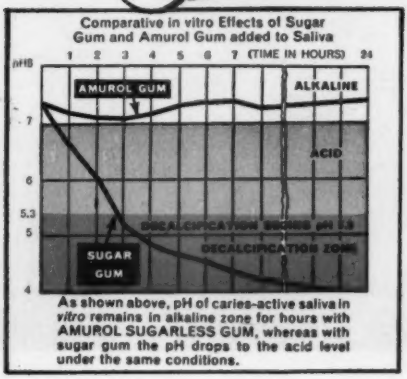


As shown above, pH of caries-active saliva in *vitro* remains in alkaline zone for hours with AMUROL SUGARLESS GUM, whereas with sugar gum the pH drops to the acid level under the same conditions.

SUGARLESS "SWEETS"

WHEN you advise your caries-active patients to reduce sugar intake, their desire for "something sweet" often makes your professional recommendation difficult to follow.

In such cases your patients will find that Amurol Sugarless Gum and Mints satisfy the "sweet tooth" without promoting caries. They are delicious, refreshing, yet free from sugar. Sold everywhere in a variety of flavors.

Amurol samples and patient literature are available upon request.

AMUROL PRODUCTS CO. NAPERVILLE, ILLINOIS

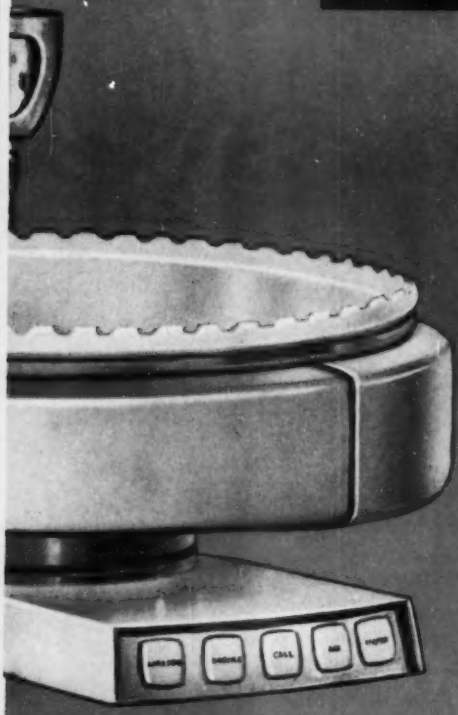
everything convenient...instruments
This assembly includes a new type of motorized pulp tester with fingertip control, new X-ray illuminator enabling you to refer to the image as you work . . . and spray bottle heater with automatic temperature control.
Sliding door conceals instruments from patients. At your option, the accessory table may include air cutoff, warm water syringe, warm air syringe and mouth lamp with mirror or cautery. No back pull on instrument cords. Easily retractable.
S. S. WHITE PRODUCTS GIVE YOU HIGHEST VALUE FOR YOUR

S. S. WHITE DENTAL UNITS

concealed

Selectron

MODELS



S. S. WHITE DENTAL UNIT
SELECTRON MODEL 111

Simplicity of form and function characterizes the Selectron . . . dentistry's newest concept in operating ease and convenience. Automatic controls are at your fingertips. Instruments are concealed, yet always easily accessible from any position. Water and electrical systems are separate for assured safety . . . and each Selectron model is designed to accommodate extras when necessary. Ask your dealer about the automatic, streamlined Selectron . . . or write direct.

On dual arm models, the conventional handpiece or the Airotor can be put into immediate use by pushing a button. Air, water or spray for the conventional handpiece can be similarly selected. Buttons light up when activated and the light on the Airotor button blinks, indicating drip rate of the lubricating oil.

THE S. S. WHITE DENTAL MFG. CO.,
Philadelphia 5, Pa.

DOLLAR. WITH THE BEST IN QUALITY FOR YOUR PRACTICE.

NEW TWINS!

Steele's

now offers

POSTERIOR TRUPONTICS

IN THE MATERIAL OF YOUR CHOICE

PLASTIC Biotone* Shades

OR

PORCELAIN New Hue Shades

THEY'RE INTERCHANGEABLE

The freedom of choice that you have enjoyed in Flatback Facings is now yours in Trupontics.

The new Plastic Trupontic is made of a proved plastic, Biotone — hard — dense — color stable — and has the outstanding advantage — INTERCHANGEABILITY. When plastic is preferred, prescribe Steele's Plastic Trupontics.*

*Registered Trademark of The Dentists' Supply Co. of N. Y.

THE COLUMBUS DENTAL MANUFACTURING CO.
COLUMBUS 6, OHIO

Steele's

Py·co·pay TOOTHBRUSH...

THE PROFESSION'S CHOICE

to promote more effective brushing and better oral health:

- **SMALL, NARROW HEAD** provides accessibility to all posterior lingual areas.
- **UNIFORMLY TRIMMED BRISTLES** assure gentle and effective cleansing.
- **STRAIGHT, RIGID HANDLE** permits adequate control for correct brushing and gingival hygiene.
- **PY-CO-TIP RUBBER CONE** supplies optimum flexibility for interdental cleansing.

Py-co-pay is available in a wide range of textures to fit every individual need—medium, hard and extra hard nylon; "Softex" multi-tufted nylon; hard and extra hard in first cut Chungking natural bristle (all natural bristle brushes are "Duratized" for longer wear). All brushes are "Steratized" to sanitize the brush.

BLOCK DRUG COMPANY, INC.

"Quality Products for Dental Health"

Py-co-pay recommended by more dentists than any other toothbrush.

FOR SATISFACTORY ANESTHESIA IN ALL PROCEDURES

Now, with two solutions on hand, you have a choice of preparations to serve all the anesthetic needs of daily practice.

For rapid acting,[1-2] well tolerated[1-5] anesthesia of comparatively BRIEF DURATION[6] — as in high-speed restorative procedures... simple extractions... children's dentistry... and whenever vasoconstricting agents are contraindicated — choose new CARBOCAINE 3% without vasoconstrictor.

For satisfactory[4] anesthesia of LONGER DURATION, well tolerated, with a wide margin of safety [3-7] — as in oral and periodontal surgery

References: 1. Berling, C. Carbocaine in local anaesthesia in the oral cavity. Odont. Revy. 9:254 1958. 2. Feldmann, G., and Nordenram, A. The anaesthetic effect of Carbocaine and lidocaine. Svenska Tandl.-Tidskr. 52:531 1959. 3. Weil, C., Welham, F. S., Santangelo, C. and Yackel, R. F. Clinical evaluation of mepivacaine hydrochloride by a new method. J.A.D.A. 63:26 July 1961. 4. Dobbs, E. C., and Ross, N. The new

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...quadrant dentistry...pulp canal work — CARBOCAINE 2% with Neo-Cobefrin® is the anesthetic of wide professional acceptance.

Successful practices need BOTH preparations for routine procedures. Choose CARBOCAINE in any case...use CARBOCAINE with the full assurance you are using an anesthetic that meets the highest standards of efficiency and performance.

THE SELECT ANESTHETICS FOR ROUTINE USE

local anesthetic, Carbocaine. New York State D.J. (to be published). 5. Wessman, T. A private practitioner's view of a local anesthetic without a vasoconstrictor. Sverig. Tandläk.-Forb. Tidn. No. 3 1959. 6. Schwarzkopf, H. A further advance within the field of odontological local anesthesia. Deutsche Zahnärztebl. No. 24 1959. 7. Ross, N., and Dobbs, E. C. A preliminary study on Carbocaine. J.A.D.S.A. 7:4 Nov. 1960.

LONGER DURATION

COOK-WAITE Laboratories, Inc.

1450 Broadway • New York 18, N.Y.

CARBOCAINE AND NEO-COBEFRIN (BRAND OF LEVO-NORDEFRIN) ARE THE TRADEMARKS (REG. U.S. PAT. OFF.) OF STERLING DRUG INC.

You're Missing Something..

A. *Hygiene*

Luxene denture base material and Luxene teeth combine chemically. This produces a sanitary denture which excludes the infiltration of bacteria between the teeth and the base.

B. *Strength and Stability*

The Luxene All-Vinyl Denture provides the highest standards of toughness, and chemical and dimensional stability. Clinical reports reveal practically no breakage of the base or the teeth.*

LUXENE

LUXENE INC.

1450 Broadway • New York 18, N.Y.
CARBOCAINE AND NEO-COBEFRIN (BRAND OF LEVO-NORDEFRIN) ARE THE TRADEMARKS (REG. U.S. PAT. OFF.) OF STERLING DRUG INC.

..... IF YOU HAVEN'T PRESCRIBED

Luxene *All-Vinyl Dentures*

C. *Esthetics*

The Luxene All-Vinyl Denture will give you and your patient what you are both looking for — a restoration that is completely natural in appearance.

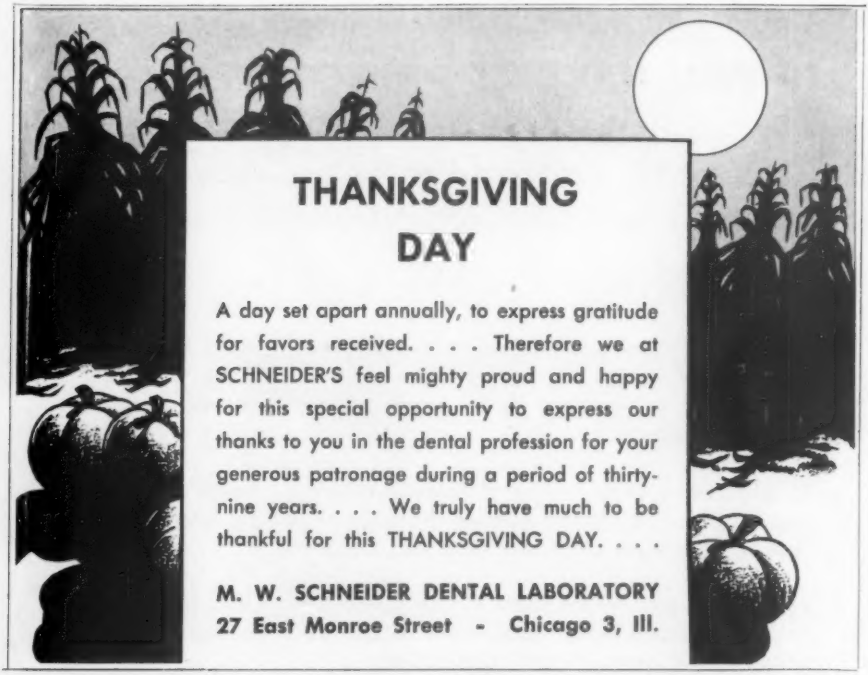
To provide a wide range of selection, Luxene Teeth are available in 24 lifelike shades. Request a Luxene Shade Guide from your Luxene Processing Laboratory.

The time-tested superiority of the Luxene All-Vinyl Denture has been established over a 20 year period by patient and professional satisfaction.

LUXENE VINYL RESIN is an exclusive product of the dental profession. It has no other commercial uses. The quality standards which it maintains under all mouth conditions are consistent with the profession's standards for dental health.

*NOVEMBER 1960 JADA: "Clinical Observations of Number of Fractures of Acrylic and Modified Copolymer Vinyl Dentures"; William F. D. Grant, D.D.S., department of dentistry and oral surgery, Henry Ford Hospital.

NEW YORK



THANKSGIVING DAY

A day set apart annually, to express gratitude for favors received. . . . Therefore we at SCHNEIDER'S feel mighty proud and happy for this special opportunity to express our thanks to you in the dental profession for your generous patronage during a period of thirty-nine years. . . . We truly have much to be thankful for this THANKSGIVING DAY. . . .

M. W. SCHNEIDER DENTAL LABORATORY
27 East Monroe Street - Chicago 3, Ill.

THE CRAVING FOR SWEETS—

and how to face up to it

Sweet drinks need no longer be taboo to caries-prone patients. Sugar and cavities seem to go together, but all that is sweet is not sugar.

FIZZIES Instant Sparkling Drink Tablets satisfy almost anybody's sweet tooth and they're totally sugar-free. Sweetening is supplied by artificial-sweeteners Sucaryl® and Saccharin. There isn't a cavity in a carton.

You just drop a FIZZIES Tablet in a glass of ice water. In seconds, you've got a sparkling, delicious drink.

FIZZIES are as popular with many grownups as they are with the Deciduous Teeth Set. Recommend FIZZIES with confidence to all sweets-loving patients.

FIZZIES ... THE TABLET THAT MAKES AN INSTANT, SPARKLING DRINK

POSITIVE
PULP
PROTECTION

Pulpdent® ROWER

LIQUID

BRAND OF CALCIUM HYDROXIDE-METHYLCELLULOSE SUSPENSION

CAVITY LINER

PROTECTS
PULP
3 WAYS

1 NEUTRALIZES cement acids

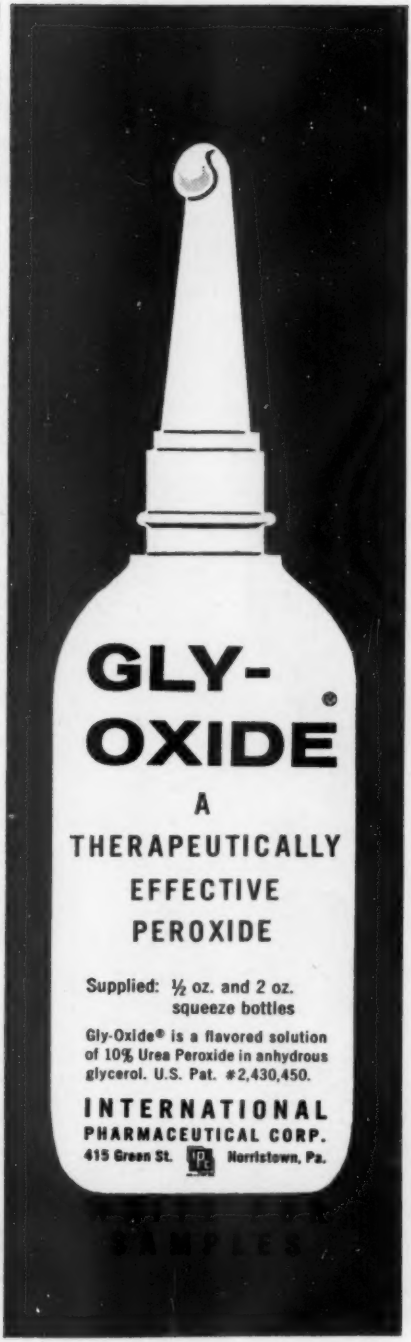
2 MINIMIZES thermal shock

3 STIMULATES formation of secondary dentin

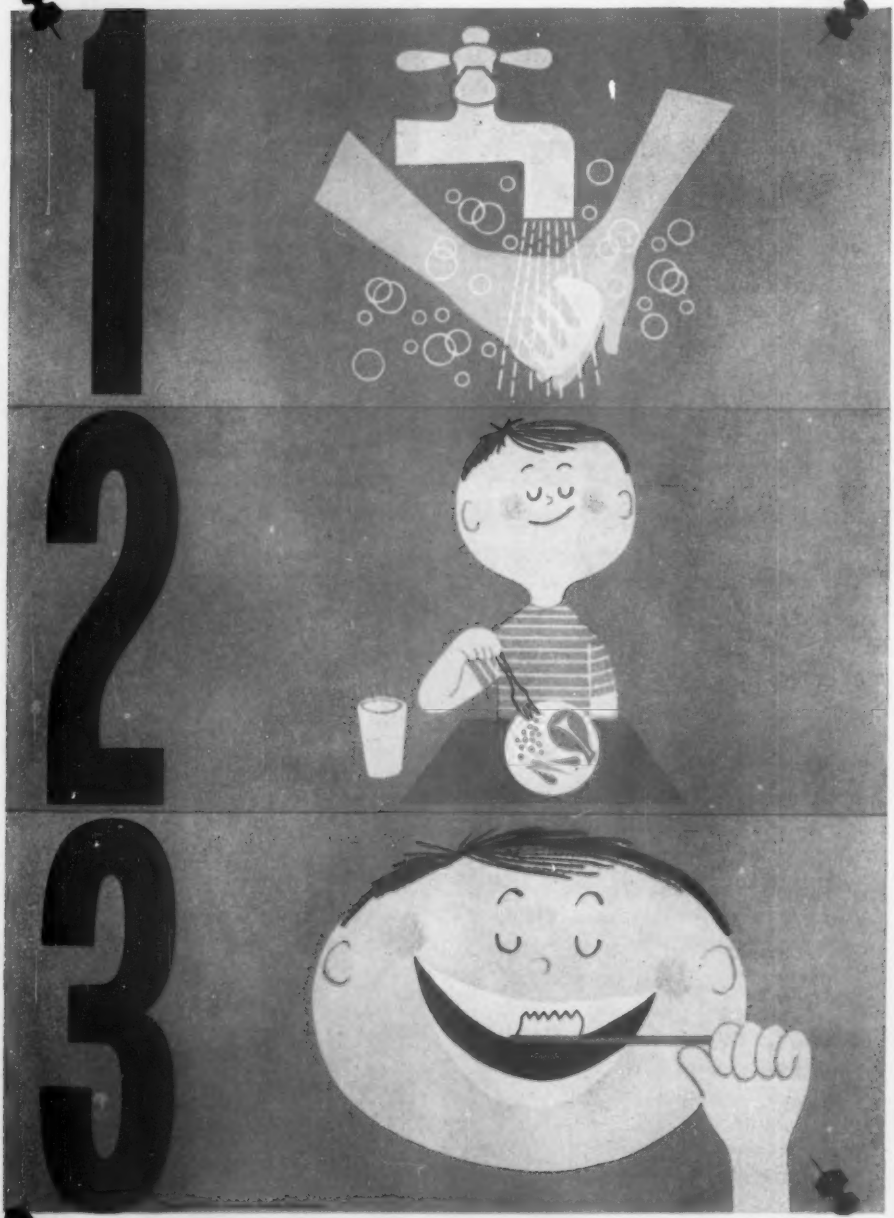
BE SECURE . . . rely only on PULPDENT (Rower) LIQUID, the original, premixed calcium hydroxide cavity liner. Clinically proven, safe, effective. Available at recognized dental dealers.

For further information, write to:

ROWER DENTAL MFG. CORP.
Boston 16, Mass., U.S.A.



IDEA FOR PREVENTIVE CARE *Second in a series of ideas gathered*



Posters are available to the profession from the American Dental Association, Bureau of Dental Health Education, Dept. A, 222 East Superior Street, Chicago

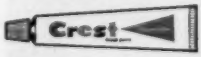
from various sources by the Professional Services Division of Procter & Gamble . . .

WASH EAT BRUSH

"You've got to show parents how to teach their children good dental habits," a dentist told us recently. "For example, I point out that it's just as easy, and just as important, to teach kids to brush their teeth after meals as it is to wash their hands before they eat. It is the sort of thing that soon can become an ingrained habit, rather than just a good rule that is rarely practiced."

Interesting idea, we think, that owes its effectiveness to its simplicity. And it's doubly interesting because we also learned that the American Dental Association has a poster that can be used in both the dental office and the home to teach the WASH-EAT-BRUSH habit. A miniature of the three-color poster is reproduced at the left in black and white. Note that it tells the story without words, so it's a suitable reminder for children of any age.

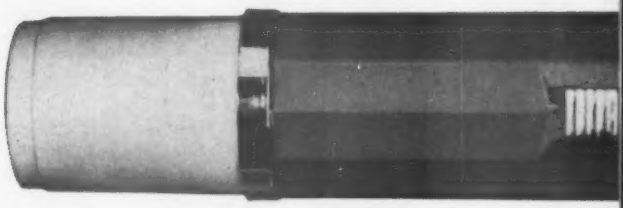
You can strengthen the WASH-EAT-BRUSH habit by advising patients to "brush with Crest." Reason: long-term patient cooperation usually is linked directly to the *results* of preventive care, and Crest helps significantly to improve results. In one clinical study[1], patients who brushed three times daily with Crest had *46% less decay* than patients who brushed three times daily with regular toothpaste. Other studies[2-6] showed that Crest reduced caries 21%-49% in unsupervised home use, compared with regular toothpaste.



1. J.Dent. Res., 39:871 (1960) and Peffley, G. (Private Communication). 2. J.A.D.A., 50:163 (1955). 3. J.A.D.A., 51:556 (1955). 4. J.A.D.A., 55:196 (1957). 5. J.A.D.A., 58:43 (1959). 6. J. Dent. Res., 39:955 (1960).

Large office posters (12" x 16½") cost 25¢, including postage; small home posters (3" x 4") are shipped for $2.25 per hundred. Please order directly from the Bureau of Dental Health Education.

NEW! FROM GENERAL

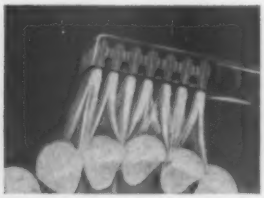


Automatic Toothbrush gives your patients

The value of powered brushing has long been demonstrated by your own prophylaxis brush. Now, General Electric scientists have applied power to a toothbrush giving optimum cleaning efficiency and safety in home use. The brushing action of this home dental instrument has been determined by objective scientific inquiry into all available methods. Rotary and orbital actions were found unsafe in self-use. Up-and-down methods, and oscillation in an arc, tended to force debris into the gingival sulci. As a result, the General Electric Automatic Toothbrush combines a *short*, rapid stroke and bristles of increased length and flexibility. Clinical studies show this scientific method gives four advantages over typical handbrushing: (1) more effective cleaning of smooth surfaces, fissures and interproximal regions; (2) pleasant pulsating on gingival tissue as teeth are brushed: (3) decreased trauma of gingival tissue; and (4) *decreased abrasion of dentin.*

The General Electric Automatic Toothbrush includes a self-powered handle, four snap-in brushes and a holder. The holder recharges the power handle for many brushings between charges.

Penetration in interproximal regions. Flexing of the bristles results in deep penetration and cleaning of the interproximal regions. Bristles pivot on adjacent teeth, and pry out debris.



Minimal abrasive effect. The lighter pressure that is required results in significantly less abrasion. The possibility of excessive abrasion of dentin is greatly reduced.

Debris removal from gingival sulci. The short, back-and-forth stroke permits the bristles to follow the curved line of the gingivae. The bristles are better able to remove debris.

ELECTRIC RESEARCH

cleaner teeth and gingivae than handbrushing

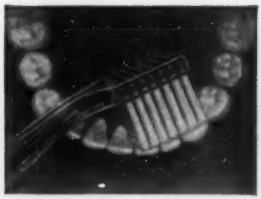
Now many more of your patients can obtain thorough cleaning of the teeth, safe polishing of the teeth, and pleasant, healthful care of the gingivae. The new General Electric Automatic Toothbrush applies effective brushing action with far less dependence on the user's patience or physical dexterity. This brushing action gives your patients safe, thorough cleaning of the smooth surfaces, fissures, the interproximal regions, the gingival sulci, the posterior surfaces, the exposed distal surfaces of the molars, as well as the gingivae.

The General Electric Automatic Toothbrush is designed so even young children will find it pleasant, convenient and safe. The handle has no electric cord. Its power is derived from a self-contained nickel-cadmium battery which automatically recharges in the toothbrush holder. The General Electric Automatic Toothbrush can supplement your own professional dental care. Sold in drug stores and drug departments at a suggested retail price of $19.95.* *General Electric Co., Dental Health Section, Clock and Timer Dept., Ashland, Mass.*

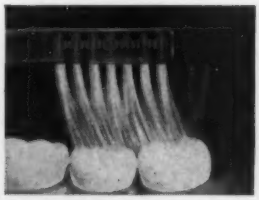
***Available to the profession at $9.50 when ordered from Dental Health Section.**

Progress Is Our Most Important Product

GENERAL ELECTRIC



Conformation to lingual arch contour. The short brush head, in combination with the short stroke, facilitates cleaning of the surfaces forming the lingual arch contour.



Concentrated brushing action. The brush moves only 3/16". In addition, the bristles flex so their tips lag behind the brush movement. This further intensifies cleaning action.

Access to distal surfaces. The short, rapid strokes allow the brush to effectively reach and clean even the hard-to-reach surfaces such as exposed distal surfaces of the last molars.

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pain

**of trauma, infection,
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Ethoheptazine Citrate (75 mg.) with Acetylsalicylic Acid (325 mg.), Wyeth

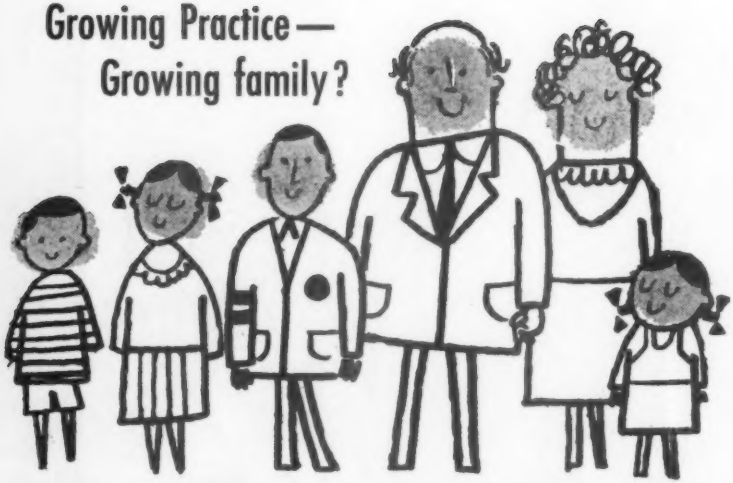
analgesia PLUS anti-inflammatory benefits

- relieves pain
- non-narcotic, nonaddicting, well tolerated
- Two ZACTIRIN tablets are equivalent in analgesic effectiveness to codeine, 32 mg. (½ gr.) plus acetylsalicylic acid, 650 mg. (10 gr.).

Wyeth Laboratories Philadelphia 1, Pa.

Wyeth
SERVICE TO DENTISTRY

Growing Practice— Growing family?



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UNDER THE A.D.A. GROUP LIFE PROGRAM

During the years when you're concerned with a growing family — and a growing practice, too — the A.D.A. Group Life Program provides $20,000 basic life insurance ($30,000 for accidental death) up to age 60, with benefits scaling down after that age.

You get this big protection for these low yearly premiums:

- $40 to age 30
- $80 from age 31 to 40
- $160 from age 41 to 50
- $260 from age 51 to 60
- $300 for reducing amounts beyond age 60

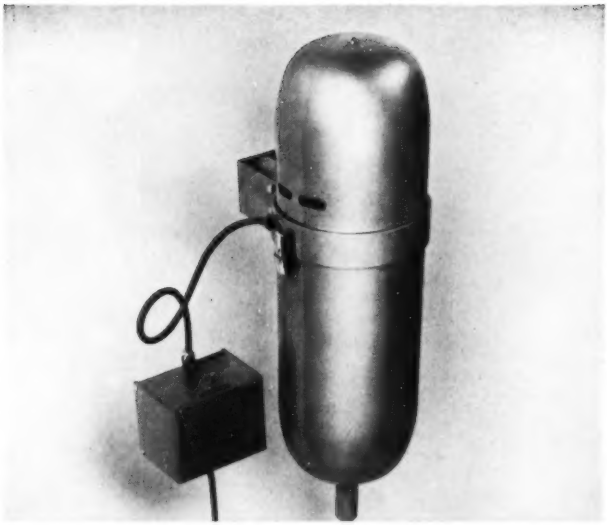
The A.D.A. Group Life Program is underwritten and administered by the Great-West Life Assurance Company.

Don't delay! Enquire about enrollment today.

For details, write to: A.D.A. GROUP LIFE PROGRAM
The Great-West Life Assurance Company
1035 Field Building
135 S. LaSalle St., Chicago 3, Ill.

THE GREAT-WEST LIFE ASSURANCE COMPANY
HEAD OFFICE - WINNIPEG, CANADA

YOUR FUTURE IS OUR BUSINESS TODAY!



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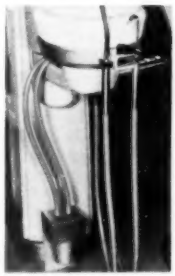
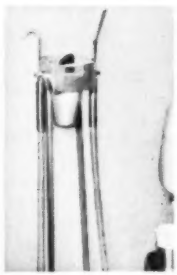
PEL-VAC *Zephyr*

AMAZINGLY QUIET **CENTRAL SYSTEM EVACUATOR**

This more versatile application of the popular PEL-VAC Zephyr is ideally adapted to high-speed dentistry and high office traffic. It permits working from one operatory to another without loss of time. The power unit is unseen and out of the way, which helps reduce patient apprehension. Works by air velocity, not just vacuum, to increase patient comfort. Write for full details.

PEL-VAC Zephyr central system serves up to 4 hoses within a 60-foot line from the power unit. Outlets available for one or two hoses, as desired.





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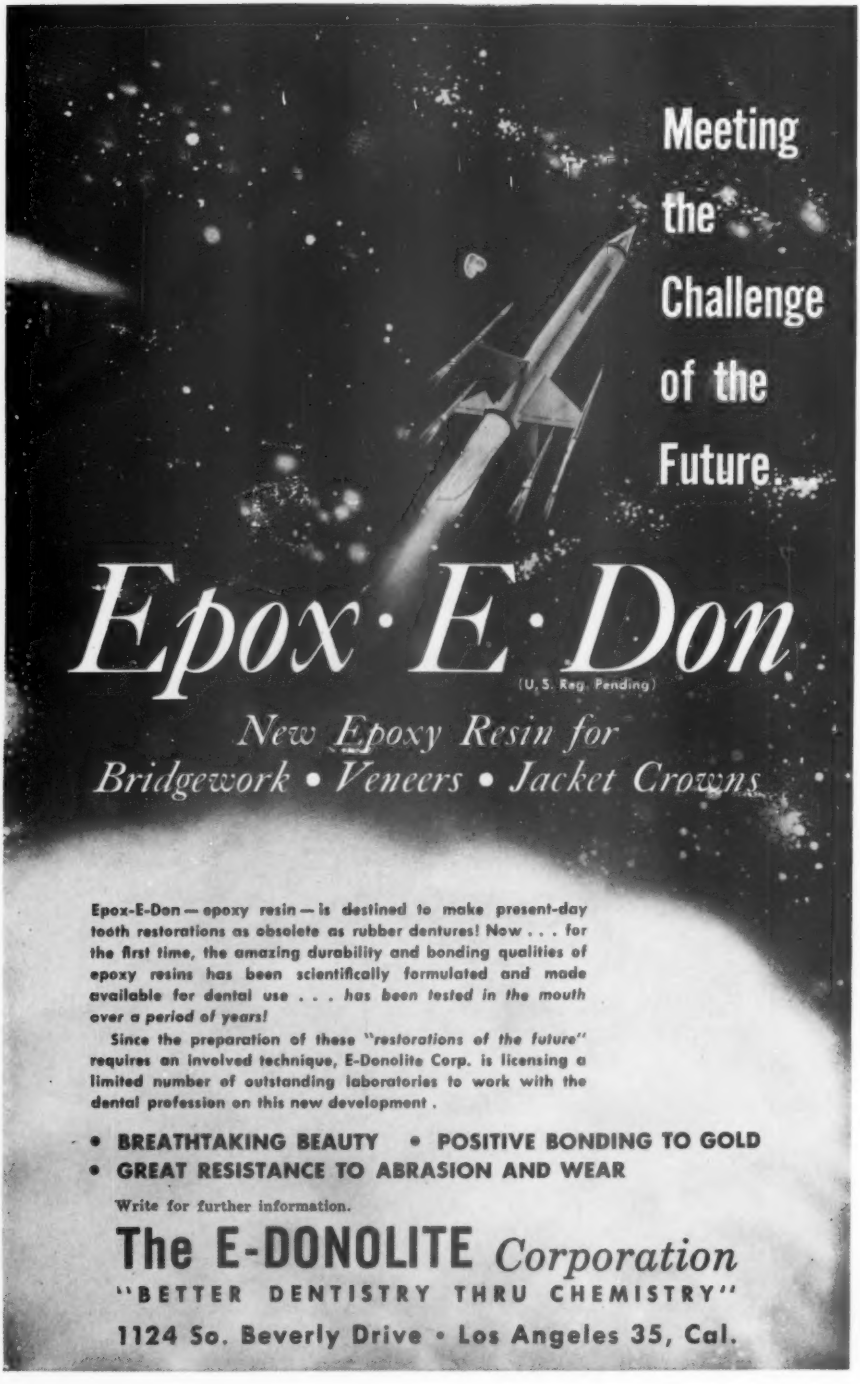
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